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1939 XXXV

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FLIGHT
and The AIRCRAFT ENGINEER

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The Outlook

Sir Philip Sassoon

IT is only twenty-one years since the Air Ministry came into existence and in that comparatively short time death has carried off Lord Thomson, Air Minister, Capt. Guest, ex-Air Minister, and now Sir Philip Sassoon, ex-Under-Secretary. Sir Philip was far from being an old man—he was only fifty—and his gifts, combined with his wealth, seemed to mark him out for still higher distinctions than he had yet attained. He held the office of Under-Secretary for Air for more years than any other politician has yet done, and at one time he seemed to be almost identified with the Air Ministry.

An Under-Secretaryship is not an office which gives many chances of achieving distinction, and Sir Philip was a man who never sought the limelight. On the contrary he avoided it. He served the country and society in many ways, but the good which he did was done, one might almost say, under a bushel. Only when he had to introduce Air Estimates did he fill the centre of the stage, and then he always won praise for the admirable way in which he handled his subject. On his many visits to Air Force stations he always made friends, and the Service was able to appreciate his merits in a way which he gave the general public few chances to do. As First Commissioner for Works he proved himself the right man in the right place, and his death is a real loss to the country.

These Licences

ESSENTIALLY, the idea of increasing the number of licences or endorsements available to professional pilots is a good one, and nowhere is it more necessary nowadays than in airline flying. The standards of proficiency and experience voluntarily demanded for transport work in present conditions and with modern super-efficient aircraft are, for instance, disproportionately higher than those required merely for obtaining the normal "B" licence. In fact, the airline operators themselves give some idea of the necessary qualifications by requiring a good deal more than the mere possession of a "B" licence by prospective members of their flying staffs.

Until such a time—and we have been waiting for two years—as a specialised transport pilot's "B" licence is issued, there is the G.A.P.A.N.'s Master Pilot's Licence, which at least indicates considerable experience in both day and night flying where the holder is concerned. Now the Guild has introduced a Master Instructor's Diploma, largely in order to increase the prestige of those with a very considerable experience of instructional work.

Nevertheless, it seems to us that the requirements are not nearly severe enough. A total of 2,500 hours' instruction is not, in these days, a very great deal, and even on the preliminary list of those who have qualified for the Diploma there are well over forty names. The new assistant instructor's category, the ordinary instructor's endorsement, and the Master Instructor's Diploma are all too close together in experience requirements. Admittedly the Guild have left another loophole for super experience in the Extra Master Instructor's Diploma, but this will presumably be offered only in exceptional cases.

In the meantime, there is the risk that too many licences, diplomas, endorsements and what not will be available to too many people. It is the custom nowadays to lower the quality of products while still calling them by their old names, and when, eventually, it is necessary to reintroduce the original product it must be called a super-X. This super-X is nothing more or less than X as it was twenty years ago. Let us not have too many super-pilots and super-super-pilots, or we shall be back exactly where we started.

The Outlook

Air Militiamen

ONE of the greatest advantages of compulsory service is that it sets at rest the mind of the young man who would like to serve his country, but fears that if he does so some less patriotic youth will get the job he was hoping to get. One of its dangers is that it may reduce all and sundry, whatever their capabilities, to a dead level of barrack-square drill. What a dreadfully bad bombardier Napoleon would have made! The framers of the Military Training Act in this country have realised this, and show signs of trying to avoid the drawback. The Act is primarily intended to help the Army, but those who feel themselves drawn to the air will not be obliged to spend their time learning to "form threes." They may join the R.A.F.V.R.

Of course, they will not find it a "cushy job" in the sense that they will escape with less training than their confreres in the Army will receive. They must join for five years, and in the first year they must, if they have joined the ground section, put in six months' training with a regular squadron, and in subsequent years come up for fifteen days' training when required. If they have been accepted for the air section, as pilot, observer, or wireless operator/air gunner, they will be trained at a centre of the Volunteer Reserve, and the numbers to be accepted for this section are limited by the proviso that all the candidates must live near one of the centres. One of the unforeseen results of the Act may be that houses in the vicinity of a V.R. centre or aerodrome will be sought after, instead of there being a tendency to avoid such localities because of the noise question.

Little Things

NOW and again some peculiarity of behaviour of an aircraft serves to remind us of how comparatively little we still know about the flow of air. There is, for example, the case of the twin-engined bomber which had originally been fitted with air-cooled engines and which subsequently had liquid-cooled engines installed. It developed instability. It was not merely a case of the c.g. being "out" a few inches, but actual dynamic instability. No very obvious explanation seems to cover the case, but there it is.

Even more remarkable was the story of the trimming tab, told us by Mr. Lankester Parker the other day. One of the Empire boats needed about four degrees of rudder to hold it straight, and the ordinary inspection failed to reveal any respect in which this particular boat differed from any of its thirty-odd sisters.

Ultimately it was discovered that the trimming tab on the trailing edge of the rudder was about one-sixteenth of an inch under size in width. This tab has its hinge on one side to accommodate a buried control, and the "free" side of the tab was this small fraction inside the line of the rudder. One would hardly have expected the effect on directional stability to be noticeable, yet this slight dissymmetry required as much correction with the rudder as does flying the machine with one engine stopped. The incident was of no practical importance, but Mr. Parker became curious to know what could have caused the yawing, and so the careful inspection was made.

Transatlantic Telephony

MOST of us have, at one time or another of our lives, had an experience which stamps itself on our memory. It may be one which has marked a turning point, or it may be seemingly trivial; it may be pleasant or the reverse; it may be of importance to ourselves only, or it may affect the world. But there it is, fixed in the hidden recesses of memory and merely awaiting the right conditions to jump out with startling clarity.

One imagines that, no matter where he goes in his numerous perambulations, no matter what new scenes his travels unroll before his eyes, Major Lester Gardner will not forget an incident on the steamer when coming across, with Dr. Lewis, for the latter's Wilbur Wright Memorial Lecture to the R.Ae.S. They had left New York in the *Washington* three and a half days previously. It was 2.30 in the morning, and the Boeing 314 *Yankee Clipper* had left New York at noon the previous day on its way to Marseilles. Lester Gardner thought it would be a courteous act to send a radiogram with good wishes from himself and Dr. Lewis to the flying boat. After a short delay he was called up to the radio office and asked if he would like to speak to the *Yankee Clipper*. To his surprise, he heard, faintly but perfectly clear, the voice of Col. Carroll Cone, chief of Pan America's Atlantic Division, who was on board the flying boat. The *Clipper's* transmitter is not, of course, intended for long-range working on telephony, but the voice came through very well indeed, while the powerful transmitter of the *Washington* was heard clearly in the flying boat.

The event was more than a surprise for Lester Gardner. It presages the not very distant future when passengers on flying boats in regular transatlantic service can speak—though *not* on the navigational wavelengths—to friends on ships or do business with offices ashore on both sides of the Atlantic. But as we said a week or two ago, there must be more than five experimental mail flights before regular passenger air transport by flying boat can be undertaken with that assurance of safety which is requisite. And wireless will play a very important part in ensuring that safety.

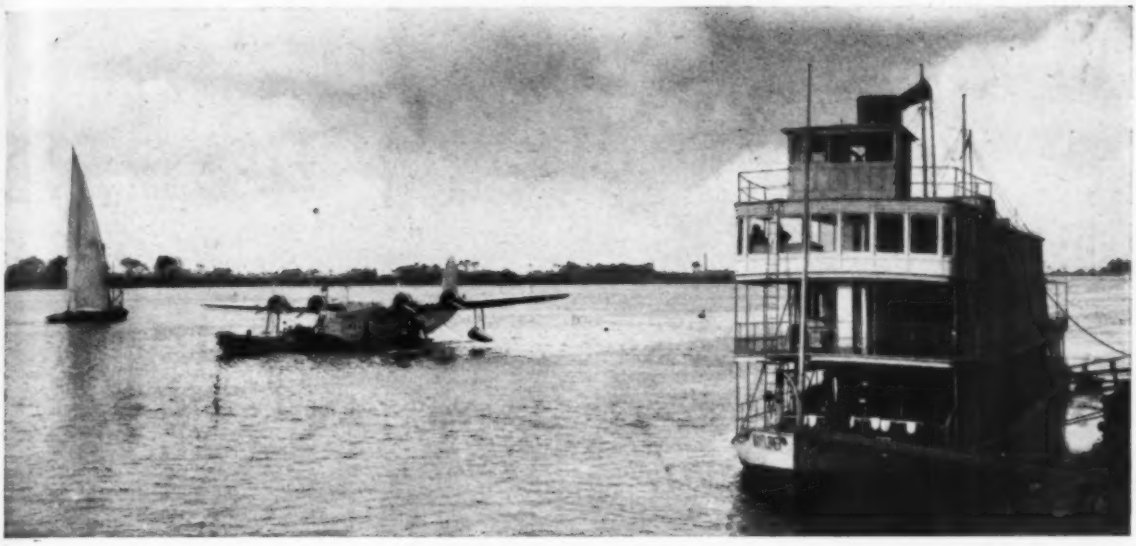
Forthcoming Events

JUNE

Sat., 17th. Official Opening of Derby Municipal Airport (Burnaston) by Sir Kingsley Wood.
Sun., 18th. Brooklands Flying Club Four-club Competition.
Wed., 21st. Aero Golfing Society: Jubilee Cup, Berkshire Golf Club.
Sat. 24th - Thurs., 29th. Hungarian Touring Club: Magyar Pilota Picnic.
Sat., 24th. Royal Air Force Garden Party.

JULY.

Sat., 1st. South Staffordshire Aero Club: Walsall Air Display.
Opening of Grangemouth (Scotland) Airport by Lord Trenchard.
Lancashire Aero Club. Garden Party at Woodford.
Sat., 8th. Official Opening of Birmingham Airport (Elmdon) by H.R.H. the Duchess of Kent.
Sat., 8th-Sun., 16th. National Gliding Contests, Great Hucklow.
Sat., 8th-Sun., 23rd. Brussels Aero Show.
Sat., 15th-Mon., 17th. Deauville Air Rally.
Sun., 16th-Sun., 23rd. Italian Aero Club: Littorio Rally, Rimini.
Sat., 22nd. Gosport Reunion, Brooklands.
Sat., 22nd-Tues., 25th. Aero-Club de l'Ouest de la France: Plantagenet Rally.
Fri., 28th-Sun., 30th. Cannes Aero Club: Deauville-Vichy-Cannes Rally.
Sat., 29th-Sun., 30th. Frankfurt International Flying Meeting.



AFRICAN SCENE : One of Imperials' flying boats moored on the Nile beside the passengers' rest "house"—the good ship *Mayflower*.

TOPICS of the DAY

New Dangers

NECESSARY though it undoubtedly is in these days of intensive R.A.F. training for Service pilots to fly at all times, in all weathers and sometimes over thickly inhabitated urban areas, I cannot help feeling that freedom, in some cases, is being abused.

When, in the course of normal private peregrinations, a trio of Battles suddenly pop out of the clouds a hundred yards or so to the right of one's machine, no complaint can be made, since cloud flying training is so very necessary; and, in any case, I shouldn't be flying so near to the cloud-base, however low. But the pilot of a transport machine, carrying anything up to twenty paying passengers, is righteously incensed if, without any warning at all, a flight or a squadron of military machines is seen breaking the overcast on one of the normal air routes.

He very reasonably wonders what is the good of all this careful traffic control (and only last week he may have spent three-quarters of an hour making blind turns just outside the controlled zone while waiting for permission to come in) if other uncontrolled machines are to plunge furiously about inside a cloud layer. Goodness knows there is a sufficient amount of trouble if an unfortunate private owner so much as touches the fringe of the zone without previously obtaining permission from the control officer at the local terminal.

Even in perfectly good weather the possible dangers are not unnoticeable. A few weeks ago a Blenheim was seen (and heard) doing high-speed aerobatics over the middle of London. During the performance a Lockheed Fourteen came by, on its way back from Stockholm or Warsaw, and used precisely that part of the sky which had been covered by the Blenheim with innumerable rocket stalled turns—to invent a new aerobatic expression. Probably, the pilot of the Fourteen was "living in" at the time, and he may or may not have seen the Blenheim. Obviously, it was up to the pilot of the latter to keep a look-out, but it is not always easy to see other machines, particularly when concentrating on aerobatic elegancies.

A few days previously a couple of Harts (or Audaxes or whatever) had duly frightened everybody in a suburban area by flying about, sometimes in formation and sometimes in mock battle, under a cloud base which could not, at the time, have been much higher than five hundred feet. Possibly to the uninitiated the performance looked more dangerous than it really was, but it has already been shown that even a comparatively small military aeroplane can have the effect of a high explosive bomb when it is accidentally stalled into a populous area.

Some remarkable exhibitions, too, are put up by night fighter pilots, though in this case the lowness or otherwise of the flying can only be judged by the speed at which the navigation lights cover the visible area of sky. More than once recently I have heard what was obviously a Hurricane hurricaning about while a co-operation Rapide droned wearily along at approximately the same altitude. Possibly the pilot of the Hurricane was on the look-out, but he certainly could not have seen what is immediately below and in front of him, and one of these days a fighter is going to take the top wing off a charter machine—with an easily imagined holocaust to follow.

Nor is it entirely necessary in the interests of training to fly at fifty feet or so in the middle of the night over a south coast resort. These modern high-speed fighters are not noisy and probably do not annoy the residents, since the effect of such a passage is more one of concussion than noise. Personally, I can imagine nothing more exciting than this sort of thing, especially for the pilot, but it would make such a mess if he misjudged his height by fifty feet.

It is curious to discover how little room there is in the sky. Only a fortnight ago, while flying back from the Midlands, I was practically cut in half by a Blenheim foursome which appeared out of an empty sky. All of us had three dimensions to move in over the whole country and we passed, our tracks at right-angles, within a hundred feet. A pleasing close-up of the type was provided for me.

Stalling Curiosities

WHILE on (or off) the subject of aerobatics, there seems to be a good deal of misunderstanding about stalling speeds, and so forth, during violent manœuvres. The other day I saw some stalling-speed curves covering turns of various degrees of steepness. The speed at which everything falls away, even in a moderately tight turn, is quite surprisingly high.

By replotting similar curves for a light aeroplane that I know, I found that it stalled at about 80 m.p.h. in a really tight turn. Some time ago I had an argument with someone who denied hotly that forced loading, in a turn or a

(*Concluded on page 582.*)

The C.40 Autogiro is considerably "cleaned-up," as compared with the C.30, by a streamline casing around the upper part of the pylon and a windscreen of generous dimensions in front of the cockpit. In spite of side-by-side seating the machine looks slimmer than its predecessor.

DIRECT A MAKES C

The C.40 Autogiro Now Ready F for Five : So Flying

By C. [illegible]OULSE

(Illustrated [illegible]light"

When applied to naval work the gyroplane would also seem to have many uses and advantages. Short-range submarine spotting comes to mind at once, and it is even conceivable that a gyroplane could not merely locate the submarine but could carry a depth charge and drop it with great accuracy, owing to the gyroplane's ability to sink slowly along an almost vertical flight path. Add to this the ability of the type to take off and land without forward run, and the possibilities of operation from the deck of a naval vessel become apparent.

In the latest type of Autogiro, the C.40, we have an aircraft which seems to go a long way towards doing what the helicopter is expected to do ultimately. For certain specialised work the relatively low forward speed is no great drawback; in fact, it might, in some cases, be an advantage. And the jumping start and no-run landing of this machine makes possible operation from very restricted spaces indeed. In fact, it is possible to argue that in practice it does everything which the helicopter could do. Take, for example, the case of landing. In a perfectly flat calm the helicopter could descend vertically into any space wide enough to accommodate the diameter of the rotor. But on how many days of the year do we get a flat calm? If there is any wind, and particularly if that wind is unsteady, as it usually is, and always near the ground because of obstacles, then the vertical descent becomes a very delicate operation calling for great piloting ability.

The Autogiro C.40, on the other hand, can descend very nearly vertically (in a wind the flight path is virtually vertical), although for the last few feet of the descent some forward speed is necessary if a light landing is to be made. The extra space required is, however, so small as to be unimportant, on land at any rate. On board ship there may be some slight difficulty, although

LOOKING ahead is a very good thing in all walks of life, and nowhere is foresight more necessary than in flying. This applies in civil no less than in military aviation, and that nation which succeeds in designing ahead of its time may well establish at least a temporary lead, although in the process it may make mistakes which have to be paid for in some way or other. And one must always bear in mind the fact that there may be considerable risk in attempting too much, technically speaking. An aircraft with too many new and untried features represents a combination which may prove too ambitious in that if it fails to fulfil the expectations of the designer it is difficult to assign the cause.

In the field of rotating-wing aircraft great energy is being concentrated on the development of the helicopter, and quite rightly so. The somewhat crude attempts made in recent years, although they do not in themselves represent practical solutions, have shown the way to improvement and have indicated that there is every reason to believe that a really practical helicopter *can* be produced. But it is to be expected that before this desirable object is achieved there may come to light several snags not anticipated at the moment, and it may well be three years or more before the direct-lift aircraft has got over its teething troubles.

In the meantime it does seem a pity not to make use of the intermediate step which is available in the form of the gyroplane. This type of aircraft may not be as efficient as, theoretically, is the helicopter, due to, among other things, the fact that an airscrew has to be used for propulsion and thus introduces a second source of efficiency loss. This comparative inefficiency may be the source of lack of performance, in the aeroplane sense, but one can easily visualise conditions in which a relatively low speed is no great disadvantage.

For work with the Army, for example, the ability to start from and alight on almost any small field, no matter how rough its surface, must obviously confer advantages which the aeroplane does not possess. And the fact that nearly vertical descent is possible makes the gyroplane a very useful observation platform, from which movement on the ground can be much more readily detected than from a fast-moving aeroplane.

T AKE-OFF KES GOOD

ow Re... Production : Service Order : Satisfying Impressions

By C. ...OULSEN.

(*Illustrated ...ight" Photographs*).

A "differential tail" (incidence larger on one side than on the other) and a streamlined fairing on the rudder are features of the C.40. In the picture below, the machine is seen landing on a spot that would be quite inaccessible to an aeroplane.

this could probably be got over by a comparatively simple platform arrangement.

Similarly, the take-off is now simplified by the use of jump-starting. The height reached in the jump is not very great—some 10ft. or so—and has been kept down deliberately in order to get better forward acceleration at the top of the jump. It is sufficient to get the machine out of quite ridiculously small fields, and, of course, the absence of take-off run means that rough grass land or even a ploughed field can be used. On shipboard the superstructure might present some obstruction, but even there it would probably be relatively easy to arrange for the jump start to be made obliquely to the ship's centre line.

The Cierva Autogiro Co., Ltd., have given many demonstrations at Hanworth and elsewhere, using a roped-off enclosure to represent the "field." Impressive as such demonstrations are, they cannot convey the shut-in impression because of the large surrounding space. To overcome this disability the company looked around for a suitable small field, and one was found but ten minutes' run by car from Hanworth aerodrome. This field is not only very small indeed, but it is surrounded by trees, and the approach from one side at least is obstructed by high-tension cables. Furthermore, the ground is extremely rough and at present covered in very tall grass.

The photographs which illustrate these notes were taken last week while Mr. Reginald Brie was giving us a demonstration of the C.40. They give a sufficiently convincing idea of the sort of terrain which the C.40 uses and likes. No aeroplane could possibly land there, let alone getting off again. The C.40 did so repeatedly with no trouble at all.

(*Continued overleaf.*)

The pictures below tell the story of a landing and a take-off. On the left, the machine is about to touch down. The centre photograph shows it at rest, and by the building behind it can be seen that there was no landing run. In the right-hand view (joined to the other in correct relative position as regards the ground) the machine has just "jump-started" from the spot in which it landed. Note the forward tilt, which helps the forward acceleration.

The rotor head of the C.40 is quite different from the "autodynamic." The flapping hinges are outside the incidence hinges, and a single shock damper is placed in the centre of the head, connected by arms with the three rotor blades.

One very noticeable feature of the new C.40 is the absence of "sink" from the top of the jump. The machine appears to accelerate horizontally with remarkable celerity, in spite of its fixed-pitch airscrew, and in spite of the fact that the Salmson engine, rated at 200 b.h.p., is only developing about 170 b.h.p. as installed in the C.40. This absence of sink is due partly to the new rotor head (differing in detail from the "autodynamic" head of the experimental machine) and partly to the technique of Mr. Brie in letting the nose drop slightly in the jump, so that the lift of the rotor is inclined forward and assists the airscrew in pulling the machine along. This, of course, must not be overdone, or the machine would lose height.

The new rotor head is a great improvement on the "autodynamic" in several ways. For one thing, it is very much lighter. Weight has been saved by a rearrangement of the major component parts. The pitch hinges are now placed inboard of the flapping hinges, and their angle has been changed, so that now the pitch of the blades is reduced when they are being driven and increases when they overrun the drive. Also, the slope of the hinges is such that the angular increase in pitch is smaller for a given angle of change in the plane of the rotor. This results in a smoother jump, although the maximum height reached in the jump is not quite so great. However, in practice there is usually no great advantage in jumping very high. So long as the wheels are clear of long grass, for example, that is really all that matters, provided there is no "sink" from the top of the jump.

The flapping hinges are now outside the pitch hinges, an arrangement which enables one pile of friction dampers to do the work for all three blades. Previously it was necessary to adjust the friction in individual dampers very carefully. Now that the one central damper serves all three blades (via crank arms) this is taken care of automatically.

It will be appreciated that in an aircraft like a gyroplane the throttle becomes a very important control member during take-off, and, particularly, landing. So important is this fact that in the new C.40 the pilot is able to keep his hand on the throttle all the time, except for the brief moment it takes to set the vacuum-operated control incorporated in this machine. This takes the form of a small control panel on which is a three-way cock. With the pointer in the central position the wheel brakes and the rotor brakes are "on." For revving-up the rotor the small control lever is turned to the right. This takes off the rotor brake and lets in the rotor clutch. When the rotor has reached sufficient speed (265 r.p.m. in the present rotor) the pilot turns the small control lever to the left and moves his hand immediately to the throttle lever, which is pushed forward. Owing to the very slight delay in building up the vacuum there is just comfortable time to change from rotor control lever to throttle. The vacuum system automatically declutches the rotor drive, and as soon as the rotor overruns it changes into coarse pitch automatically and the machine jumps. From the handling point of view the new arrangement is obviously a great improvement, and no "third hand" is needed.

Up and Off

When watching the C.40 jump-start, one forms the impression that the acceleration must be quite unpleasant for the occupants. Actually, as the writer can testify from personal experience, this is not the case. The rate of pitch change in the new hub is such that, although the jump only lasts about two seconds, there is no unpleasant sensation. One feels as if a gigantic hand lifted one rapidly but quite tenderly some ten feet into the air. And the absence of "sink" at the end of the jump gives a feeling of great security.

In the air the C.40 appears to behave pretty much like the C.30. The rotor seems to be very smooth, and the way it "irons out" the bumps is quite remarkable.

The landing is, of course, quite incredible, with no run at all. When the machine is handled by Mr. Brie there is no trace of a jar, although if the machine were allowed to sink on to the ground straight from the approach, it would probably strain things somewhat.

The results obtained in service with the Army and Navy C.40's will be awaited with interest.

TOPICS of the DAY

(Concluded from page 579)

loop, made any very great difference to the stalling speed. After trying it out on a conventional biplane trainer, I could assure him that it was possible to spin out of a more or less vertical turn by the application of a little bottom rudder at any speed below 80 m.p.h.

A Service pilot I know who has been flying North American trainers, or Harvards, for the first time says that these machines invariably half roll off the top of the loop. Quite erroneously, I think, he put it down to engine torque, since the uncontrollable roll does not come to pass when a loop is made in finer airscrew pitch. My idea is that the machine is simply stalled at the top, and rolls one way or the other before recovery. After all, if you pull any aeroplane round tightly enough in a turn or a loop it will either flop out or, if there is any aileron or rudder on, it will do a turn of a spin or a quick roll, according to speed.

A highly loaded aeroplane will not only stall if the control column is pulled back sharply at any speed, but may also require the most careful flying during and immediately after the take-off. If the machine is made to fly as soon as it will, it tends to sit in a stalled attitude, gathering no appreciable forward speed, and eventually drops a wing with possibly disastrous results. The time has gone when we can hoist aeroplanes into the air by a pull of the stick and hold them there regardless of attitude or air speed.

INDICATOR.

Sixty-five h.p. versus the Atlantic

IT must now be presumed that Thomas Smith, the American pilot who set out to cross the Atlantic in a 65 h.p. Aeronca, perished in the attempt.

With extra tanks fitted to give him a calculated range of 3,200 miles, Smith left Old Orchard Beach, Maine, at 9.50 a.m. B.S.T. on Sunday, May 28, and was not, so far as is known, seen again. He carried no radio. Various reports of his alleged arrival over the Scottish and Cumberland coasts probably emanated from the fact that the Isle of Man Race machines would have been returning at about that time.

There remains the very slender possibility that Smith was picked up by some small, slow ship without wireless, as happened in the historic case of Hawker and Grieve.

SIR PHILIP SASSOON

WITH great regret we have to record the death, last Saturday, June 3, of Sir Philip Sassoon, Bart., G.B.E., C.M.G., D.L., J.P., M.P., following on a severe attack of influenza. He was fifty years of age.

At the time of his death Sir Philip was First Commissioner for Works, an office for which his love of art and his great sense of what was fitting in human society fitted him to an exceptional degree. He bade fair to become the most eminent of all the politicians who have held that office. But the readers of *Flight* will chiefly remember him as Under-Secretary for Air in two Governments, from 1924 to 1929 in the Baldwin Government, and from 1931 to 1937 in the National Government. During these two periods it fell to him on a number of occasions to introduce the Air Estimates in the House of Commons, and each time his speech was a model of what such speeches ought to be. With real artistry he combined statements of fact and progress with the romantic and picturesque side of Air Force and civil flying. When answering aeronautical questions in the House he also showed an ability to sweep away irrelevancies and to get down to the root of the matter.

Twice during his terms of office he undertook long journeys by air to the East, in 1928 by flying boat, and in 1934 by landplane. On each occasion he visited India, and on the latter occasion he inspected the R.A.F. stations on the North-West frontier, as well as in Egypt and Singapore. His first journey he described in a charmingly written book, *The Fourth Route*.

Sir Philip was not content merely to help in administering air matters or to travel as a passenger. He learnt to fly himself, and from 1929 to 1932 he played an active part in the air defence scheme of the country as Squadron Leader commanding No. 601 (County of London) Squadron in the Auxiliary Air Force. On relinquishing his command he was appointed Hon. Air Commodore of the same squadron. On one occasion, when presenting the Esher Cup to No. 605 (County of Warwick) Squadron, which had won the cup many times, he remarked, "As Under-Secretary for Air, I congratulate you heartily; but as Hon. Air Commodore of No. 601 Squadron I am filled with envy and hatred." The Birmingham squadron rocked with delighted laughter.

Sir Philip also owned private aeroplanes, and had his own landing ground at his house, Trent Park, the scene of the first R.A.F. garden party last year. Among many minor acts designed to encourage flying it may be mentioned that he presented the Sassoon Cup for competition among the fighter squadrons of the R.A.F. He was a splendid host, and wherever he went he added to the enjoyment of those around him, yet he carefully shunned anything like publicity. His death at a comparatively early age will be mourned by a large circle of friends, both in the Service and outside.

The C.A.S. at the O.U.A.S.

Air Chief Marshal Sir Cyril Newall Speaks at the Oxford Squadron Dinner

FOR the first time in its history the Oxford University Air Squadron held its annual dinner (on May 26) not in its headquarters in Manor Road, but at the Clarendon Hotel in "The Corn." This was also the first occasion on which the present Chief of the Air Staff, Air Chief Marshal Sir Cyril Newall, occupied the position of principal Service guest. He explained in his speech that he only dined with one University Squadron each year, and that this was Oxford's turn. He was supported by Air Marshal C. L. Courtney and Air Vice-Marshals W. L. Welsh, P. H. L. Playfair, C. F. A. Portal, A. G. R. Garrod, E. B. Sutton, P. Babington, and Roderic M. Hill. The University guests at the high table were: The Vice-Chancellor (Mr. G. S. Gordon, President of Magdalen), the Warden of New College (the Rt. Hon. H. A. L. Fisher), the Principal of Brasenose (Dr. W. T. S. Stallybrass), the Provost of Worcester (Rev. F. J. Lys), the Provost of Oriel (Sir David Ross), the Rector of Exeter (Dr. R. R. Marett), the Warden of Merton (Sir John Miles), and other dignitaries.

In proposing the toast of "The Guests," the Chief Instructor, Wing Cdr. F. L. B. Hebbert, mentioned that next October the strength of the squadron would be increased to 100 members. During the summer term they had acquired a Link Trainer. During 1938 the squadron had put in 4,000 flying hours. As Ford had been handed over to "web-footed birds," the next camp would be held at Lympne. He hoped that the authorities would openly recognise the squadron as an officer-producing unit.

Sir Cyril Newall, in responding, said that he had handed to the chief instructor the conditions for military service as they would affect members of the squadron.

He also announced that the Air Minister was offering a cup for competition between the three University squadrons in small-bore rifle shooting. He complimented the squadron on its flying hours and flying discipline, and also thanked the Vice-Chancellor for the help which the University had given to the squadron.

The Vice-Chancellor, proposing the health of the squadron, said that he had only flown twice, during the war, and on the second occasion had suffered from the worst forms of aerobatics and had been very ill. Cheerfully and unashamedly he admitted that he was an enemy of the I.C. engine in all its forms, and belonged to "the wheelbarrow age." He dreaded the time when men would make afternoon hops to Honolulu, and all languages would be blended into one, so that people would not be able to read Shakespeare—or even Wodehouse! He then recalled, with obvious satisfaction, his experiences as a member of the selection committee for the squadron.

Mr. A. W. D. James (Magdalen) replied in a very excellent speech. He thanked the C.A.S. for coming, as he was one of the busiest men in the country. He understood that R.A.F. expansion meant doing three years' work in one year, and men up for schools could sympathise with that. He had been told that men were sleeping permanently at the Air Ministry—even at night! The O.U.A.S. was no longer just a flying club where one could be taught to fly for nothing. For the last two years it had been more or less incumbent to join the Volunteer Reserve. He spoke of the advantages of doing so, and thanked Wing Cdr. Thompson (late C.I., U.L.A.S.) and his staff at Kidlington for all they had done for him and others. He rejoiced at the increase in Britain's strength, and ended by saying that the British Lion was no longer the Lion of Least Resistance.

F. A. DE V. R.

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

INSTRUCTIONAL ORGANISATION

A Club Member Complains

MAY I express my heartfelt agreement with the remarks of "Indicator" upon the treatment of club members by flying clubs in general?

I would also like to mention two other growing evils.

At the club at which most of my flying is done, the first bookings are accepted for 10 a.m. As the machines have to be flight-tested by an instructor first, and as instructors as a tribe are habitually unpunctual, I have had 12 hours 25 min. delay out of my last twenty bookings.

Although I have the chief instructor's authority to test aircraft myself, I cannot do so without howls of protest from the junior members of the staff.

I gather that a "B" licence confers a halo upon its proud possessor, even if he was still at school when many club members were veterans of flying.

To such a pagan as myself it would seem logical to say that an instructor is just as much a servant of the club as is the cloakroom attendant, but here again I have learned my lesson.

Secondly, if a club insists on written permission being obtained from a "B" licence instructor before any flight whatsoever is made by any member, regardless of his experience, then as a matter of common decency it is up to the club to see that a "B" licence instructor is there to do the writing.

No, Sir, as regards organisation, the clubs could not organise water out of a tap. JOHN V. HEWES.

Ashstead.

A 1913 BLACKBURN

—May Fly This Year: Another Veteran in the Old Warden Stable

I WAS extremely interested in your very complete account of the activities of the Blackburn Aircraft Company in the May 25 issue of *Flight*.

You will no doubt be interested to know that the machine built for Mr. Cyril Foggin in the spring of 1913, to which you refer on page 536, is now in our workshops undergoing overhaul and, all being well, should be flying again before the end of 1939. I called in to see Mr. Cyril Foggin's partner, Mr. Montague Francis Glew, on my way through Wittering the other day, and found him busy driving his tractor on his farm. I showed him your article and he assured me that you had under-estimated the top speed of his machine, which was in the vicinity of 64 m.p.h.!

This machine is in remarkably good condition. It has a triangular fuselage and the tail unit is made of metal frames covered with a single layer of fabric.

I think that when I get this Blackburn machine flying again it will be the earliest all-British (except for the Gnome engine) machine still flying in this country.

Old Warden, R. O. SHUTTLEWORTH.

Biggleswade.

EMPIRE AIR DAY

Criticism from Glasgow

SOMETHING should, I feel, be done about bucking up Empire Air Day. The public are rolling up in greater numbers to these annual R.A.F. "at homes," but they are not being entertained as the occasion demands. We want more representative types of aircraft, more ingenuity of thought in arranging the programmes, something in miniature of what the old Hendon show used to be, and—to my mind, this is the most vital criticism—something happening all the time to hold the interest.

Ansons are not bombers, but intended for reconnaissance work, yet at some places on Empire Air Day they were used as very poor substitutes for the real thing. Surely Glasgow, second city of the Empire, was entitled to expect that Britain's latest aircraft, like Blenheims, Hurricanes, Hampdens and Whitleys, would be demonstrated, when 20,000—double last year's figure—saw the show at Abbotsinch.

True, we had the world's fastest fighter, the Spitfire, burning up the sky—an impressive few minutes at the end of the display—but it was only a straightforward fly-past, not in the least spectacular. Since there was a Spitfire test-pilot at Abbotsinch on that Saturday, a glorious opportunity was ignored of demonstrating just what this Supermarine marvel really can do.

Funny thing, the Spitfire was in the exhibition park the whole afternoon, but looked insignificant against larger aircraft, and there was nothing to indicate to the public that it was Britain's "wonder plane." And here's a real joke. The Press are barred for six months from mentioning which particular aircraft are located at individual squadrons, yet over the loud speakers on Empire Air Day what is supposed to be a dead secret regarding the Spitfire was airily given away!

I missed the aerobatic display of the Prestwick pilots, which was a grand feature of last year's display. One officer apologised to a visitor for the show, saying it was the best they could do in the short time at their disposal, as they are so busy on intensive routine training. My retort to that is—get ahead with the training, then, and cut out Empire Air Day until the international situation is more settled. J. L.

Glasgow.

MISSING THE FIELD

A Parachutist's Explanation

WHILST I very much appreciate your mention, in last week's issue, of my parachute descent at the Isle of Man Air Races, I should just like to make clear a few additional facts.

Actually I did not misjudge the wind strength as you implied, and I also intentionally cut off the 500ft. of height with a short delay. I had intended to leave the machine over the end of the public enclosure which, with the little wind there was and the small parachute I was using, would have just placed me nicely off the enclosure; this I knew before I went up as I usually estimate a position beforehand.

Unfortunately, I found when in the air and out on the wing that I could not see the enclosure underneath me owing to the fact that the cockpit of the Tipsy is well over the front spar, and I had to hold on to the cockpit edge; also, the platform ends up at the rear spar, making it impossible to see down over the trailing edge, while the fuselage is too wide to see over. Consequently I did not see my position until well after when it should have come into view. As it was 4.45 and an airline Rapide was due in at 4.50, I did not have time to go round again; so, as there were only fields underneath me I left, knowing I should be "out."

The reason I cut off 500ft. was that I was using a brand-new Service-type 24ft. G.Q. canopy, and I wished not only to test the opening shock but also the swing. This is, as you no doubt know, a small standard size canopy exactly as now being supplied to the R.A.F. by G.Q.s. As these have a 2ft. hole in the top I found the swing practically nil, the opening very rapid, and the rate of descent all that could be desired from a small 'chute. This parachute was straight from the works and untested in the air.

My six-year-old 26ft. G.Q. is worn out, after having been used by me for 124 descents—only 26 of which, incidentally, were out of the field, though many of those drops were into small joyriding fields. Anyhow, I am now carrying on with the 24ft. canopy attached to my old pack and harness.

I would like to mention what an ideal little machine I found the Tipsy to be, not only to fly in but to get out of in the air with a parachute. One has the added advantage of being able to talk easily to the pilot. B. G. DE GREEUW.

London, W.2.

WOMEN WITH 2nd CLASS NAVIGATOR'S CERTIFICATES

Several Holders

THE statement in "A. Viator's" notes in your issue of May 18, that he believes Mona Friedlander to be the only woman holding a 2nd class Navigator's ticket, is incorrect.

Rosamund Everard (Sir Lindsay Everard's cousin), now in South Africa, has a current operator's licence; Pauline Gower has held one for some years past, though I do not know whether it is still current; and I, myself, passed the examination in January, 1938, though I have not an operating licence, pending the necessary flying hours. There is also a fifth woman who has passed the examination, though I do not know whether she has the licence. She is, I believe, an instructress from Perth [probably Miss Margaret Cunnison.—ED.].

London, W.1. (MISS) FRANCES M. BUSS.

REFINED SPITFIRES: Supermarine Spitfire eight-gun fighters are now being delivered with De Havilland variable-pitch airscrews.

SERVICE AVIATION

Royal Air Force and Official Announcements : *Fleet Air Arm News : Military Aviation Abroad*

Command of No. 15 Group

THE Air Ministry announces the appointment of Air Comdre. Rey Griffith Parry, D.S.O., to assume command of the newly formed No. 15 Group, R.A.F., with effect from June 1, 1939.

Air Comdre. Parry, born in 1889, was commissioned in the Royal Navy in 1909 as an Engineer Sub-Lieutenant and in April, 1918, was transferred to the Royal Air Force. During the Great War he served afloat and at the Admiralty and Air Ministry, and for his bravery in the engine room of H.M.S. *Inflexible*, which had struck a mine, he was granted the D.S.O. on August 16, 1915. In August, 1919, he was appointed to a permanent commission as a Flight Lieutenant in the Royal Air Force.

After the War he proceeded to Middle East on technical engineering duties at No. 4 Flying Training School, and in November, 1923, was employed on technical advisory duties at Headquarters, Middle East. From October, 1926, to July, 1927, he attended Engineering Courses at the Imperial College of Science and Technology and in September, 1930, was posted in charge of the Officers' Engineering Course at the Home Aircraft Depot. In October, 1934, he was appointed Senior Equipment Staff Officer at Headquarters, Iraq, and from January, 1937, was in command of the Royal Air Force Station, Dishforth. Since July, 1938, he has been Air Officer-in-Charge of Administration at Headquarters, Coastal Command.

He was promoted to Squadron Leader in November, 1919, to Wing Commander, 1929, to Group Captain in 1935, and to his present rank in July, 1938.

The Hurricane's Performance

SO many contradictory figures have lately been quoted for the performances of our new Service types that the following manufacturers' data for the Hawker Hurricane I single-seater eight-gun fighter as now in production with a fixed-pitch airscrew are of special interest. They are obtainable at an all-up weight of 6,180lb.

Altitude (feet)	Max. Level Speed m.p.h.	Time to Height (Min.)
Sea level	255	—
5,000	277	2.1
10,000	298	4.1
15,000	319	6.3
17,500	330	7.8
20,000	328	9.5

Max. rate of climb, 2,350ft./min. at 10,000ft.
Service ceiling, 34,000ft.
Landing speed, 62 m.p.h.

The endurance at 15,000ft. with full tanks (97 gal.) at various speeds is as follows:—

Cruising speed m.p.h.	Duration hours	Range miles
275	1.93	531
200	4.25	850
170	4.55	774

Long-distance Sunderlands

A NUMBER of Short Sunderland flying boats (four Bristol Pegasus XXII engines) from Seletar, Singapore, are to undertake a formation cruise to Australia. At least four machines will take part in the cruise which has been planned to provide tactical and strategical data concerning the operation of long-range marine aircraft over the Netherlands East Indies and the adjoining seas.

It is announced that a number of Sunderlands have been ordered by the Royal Australian Air Force and these will be flown out to their base by Australian pilots, who will receive suitable training in England.

The R.A.F. Overseas

THE Air Minister recently stated in Parliament that seven more squadrons would be raised to strengthen the Overseas Commands of the R.A.F. The first of these is No. 94 Squadron, which is stationed at Aden. Hitherto the permanent Aden garrison has consisted of No. 8 (Bomber) Squadron, equipped with Vincents, a section of R.A.F. armoured cars, the Aden Protectorate Levies, the 9th (Heavy) Battery, R.A., the 20th (Fortress) Co., R.E., and an Anti-Aircraft Section, R.A. The advent of No. 94 Squadron must be very welcome on all grounds.

Manchester A.A.F. Squadron Launched

NO. 613 (City of Manchester) Squadron, A.A.F., had a "christening" ceremony at Manchester Airport on May 18. The C.O., Sqn. Ldr. E. Rhodes, presided, and the Lord Mayor of Manchester, Alderman Hart, performed the actual function, by breaking a bottle of champagne on the undercarriage of a Hawker Hind.

After the ceremony, several civic officials took advantage of invitations to make short flights in the Hind, which was piloted by Flt. Lt. Macdonald.

Naval Air Gunners

A HUNDRED and twenty vacancies exist in the newly established Flying Branch of the Royal Navy for young men between the ages of 17½-22. They will be entered as Naval Airmen for training as Air Gunners. A limited number will be selected for further training to qualify as Rating Pilot or Rating Observer. An examination will be held at Portsmouth, Devonport, Chatham, Rosyth and Manchester, on Wednesday, June 21, and not on May 31, as previously announced. Applications can be received at any Royal Naval Recruiting Station up to and including Wednesday, June 14.

Empire Air Day—Record Attendances

A NEW Empire Air Day attendance record was set up on Saturday, May 20, when more than twice the previous year's number of people visited Service aerodromes. The total attendance at the 63 stations celebrating Empire Air Day reached nearly 850,000, compared with 421,000 a year ago.

The largest attendance was at Northolt, where 56,000 visitors were present—twice last year's record figure for the same station. The next largest was at Hornchurch, where nearly 44,000 people entered the aerodrome, compared with 13,000 last year.

There were also large attendances at Hendon (41,800), Tern Hill, Salop (35,000), Hucknall, Notts (33,700), Abbotsinch, Glasgow (21,700), Biggin Hill, Kent (21,300), Castle Bromwich, Birmingham (20,600), and Acklington, Northumberland (20,000). At Church Fenton, Yorks, attendance figures jumped by over 500 per cent. to approximately 19,800 from 3,500 last year.

At 25 other stations attendances of over 10,000 were recorded as follows:—

Aldergrove (11,000), Catterick (12,000), Cranfield (12,000), Cranwell (11,800), Detling (14,400), Dishforth (10,300), Duxford (12,000), Filton (14,000), Gosport (16,000), Halton (12,000), Harwell (12,500), Henlow (17,600), Kenley (18,000), Leconfield (16,800), Leuchars (14,800), Manby (10,200), Marham (13,700), Martlesham Heath (17,200), North Weald (16,200), South Cerney (13,800), Tangmere (13,500), Turnhouse (15,700), Upper Heyford (10,200), Usworth (17,000), and Warmwell (10,500).

Nearly 7,000 passengers enjoyed flights in civil aircraft at the various R.A.F. stations. About 150,000 people attended civil aerodromes staging Empire Air Day displays, bringing the total attendance to approximately 1,000,000.

Service Aviation

Glasgow University R.A.F.V.R.

SOME time ago the proposal was made that a Glasgow University Air Squadron should be formed, but it did not meet with official approval. Instead of this, a Glasgow University section of the R.A.F. Volunteer Reserve is being raised. Membership will be limited to fifty, and members will be enrolled for five years. All students of the University, except medical students, will be eligible. It is probable that the section's flying will be carried out at Grangemouth aerodrome.

R.A.F.V.R. at Southampton

NEGOTIATIONS have been satisfactorily concluded for the establishment for an R.A.F.V.R. School at Southampton's municipal airport which already has a link with the Service through the Fleet Air Arm. The school will be used to train observers and the initial equipment will probably be Avro Ansons. Pilots will continue to do their practical flying with Air Service Training at Hamble. Work is likely to begin immediately on the erection of the necessary buildings.

New Elementary and Reserve F.T. Schools

NEW elementary and reserve flying training schools formed in the Reserve Command, as shown below:—

School.	*Place.*	*Date.*
No. 32 Elementary and Reserve Flying Training School	West Hartlepool ...	April 15, 1939
No. 35 Elementary and Reserve Flying Training School	Grangemouth	May 1, 1939
No. 43 Elementary and Reserve Flying Training School	Newcastle	June 1, 1939
No. 44 Elementary and serve Flying Training School	Elmdon (Birmingham)	May 1, 1939

Fleet Air Arm Displays

THE participation of the Fleet Air Arm as an independent unit in the displays organised for the opening of the Derby and Birmingham Airports on June 17 and July 8 respectively, is a reminder that on May 24 the manning and administration of the Fleet Air Arm was taken over entirely by the Royal Navy.

At Derby on June 17 and at Birmingham on July 8 No. 800 Squadron, from H.M.S. *Ark Royal*, will demonstrate their new Skua fighter-dive-bombers. Having climbed to about 15,000ft. they will make a mock dive-bombing attack, pulling out at about 2,000ft. This will be followed by a converging low attack and a demonstration of the art of landing on an aircraft carrier.

During Navy Week at Portsmouth, Plymouth and Chatham, on August 5 and 7 to 12 inclusive, Skuas will be seen "in action" against battleships or cruisers in the dockyard basins. In the Derby and Birmingham displays they will meet with no resistance but during Navy week a number will be "brought down" by the ships' anti-aircraft guns.

Long Service and Good Conduct Awards

THE Air Ministry announces that Long Service and Good Conduct Medals are awarded to the following airmen:—

W/Os. I. R. Blair, G. E. Bryant, F. Butler, J. G. Davies, S. J. Field, E. W. Franklin, C. W. Holbourn, F. E. Lilley, E. V. Osmond, R. C. Plumtree, C. Rankin, A. L. Whittaker.

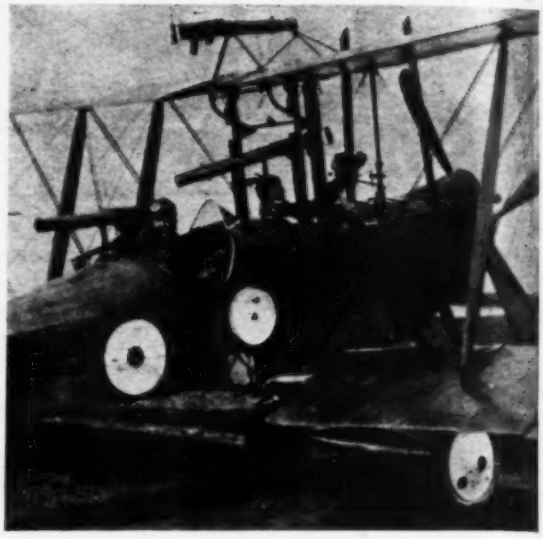
Flt. Sgts. C. Adams, F. T. Avent, L. W. Barfield, J. F. Cain, C. E. G. Canter, R. G. H. Catherall, W. M. Childs, R. G. Claydon, G. L. Colebrooke, E. S. Cooper, M. O. Davis, N. G. N. Davis, C. A. Deakin, W. B. Dean, R. B. Dumbrill, K. H. H. Ellis, W. E. Fletcher, D. G. Foreman, J. S. Forrester, L. C. Fort, C. J. Francis, K. G. Fridd, W. J. Goble, R. Gowland, W. J. Green, H. Griffiths, R. W. Guy, L. J. Hall, W. A. Harrison, A. A. Hay, A. G. Haywood, V. E. Hill, W. Howarth, J. E. Jackman, J. A. Jenkin, A. Jobberns, H. G. A. Jordan, T. J. Kenward, A. S. King, W. J. Leggett, G. S. Light, L. C. Llewellyn, H. T. F. Locke, K. R. McCormick, D. McFarlane, N. E. Martin, F. R. Miller, F. J. Mullins, J. E. Munden, J. Murphy, L. Pagram, A. Paterson, W. A. Pendlebury, J. M. Phillips, D. C. Potter, W. Pullan, G. E. Reynolds, S. A. Rickard, D. R. Sexton, A. L. Shorey, J. H. Simpson, H. J. Slater, B. A. S. Smeed, W. J. Stewart, R. E. G. Strover, W. H. Turner, J. F. Viveash, J. E. Wales, H. A. P. Watkins, C. W. Webb, A. Webber, L. Welch, C. W. Wickerson, G. R. Wood, J. A. Yeatman, M. W. Young.

Sgts. and Acting Sgts. C. J. Adamson, R. W. Aitken, F. L. Allen, B. J. Amphlett, F. G. E. Andrews, E. C. Blissett, W. Bowman, F. A. Boyle (Acting), A. Bradshaw, W. G. Bridger, R. W. Broomhead, C. E. Cahill, W. J. Collis, G. E. Cook, W. A. Crampton, T. G. W. Cushney (Acting), F. C. Dale, A. F. Dawson, J. Duff, L. A. Eades, T. J. Ellis, G. S. L. Faulkner, J. R. Foster (Acting), D. J. Galsworthy, E. W. Gibbens, A. J. Gilbert, F. J. H. Gould (Acting), F. A. Green, A. G. Hales, S. Handley, D. A. Harrison, E. T. Harvey, R. E. V. Hawker, V. A. Head, J. A. Hockey, H. Horton, G. W. J. Jones, H. Lea, G. F. Le Gassick, A. S. A. Lines, J. McIntyre, J. W. Mills, E. G. Morris (Acting), S. J. Mott (Acting), W. E. Murphy, D. S. Nash, E. W. H. Nichol, C. A. Northwood, W. M. Nowell, H. A. Oldfield, J. F. Organ, E. A. Pennell, C. W. Peters, G. Pickering (Acting), W. F. V. B. Pine, W. J. Plunkett, J. E. Potts, B. H. Reeves, H. R. Richards (Acting), H. W. G. Richer, G. Robb, W. J. Scholes, H. V. Seal, M. H. Seall, W. J. Singleton, A. L. Smith, L. E. South (Acting), F. R. Spice, W. J. Staples, F. J. C. Stephens, T. G. Stevens, C. Stokes, H. F. Stowell, L. A. H. Taylor, W. J. Tilley (Acting), V. Tonkin, H. L. Turner (Acting), F. E. Vidler (Acting), H. C. Walker (Acting), A. Weaver, C. A. Weston, H. Whimpenny, L. Wilson (Acting), J. G. B. Wyatt, T. Yule (Acting).

Cpls. E. S. Blake, C. H. Deacon, P. Dunne, W. O. Gilbert, J. H. Gloyn, R. O. Lucking, F. Millidine, G. H. Price, A. J. Quirk, W. H. S. Robinson, E. J. Skillings, P. Stewart, J. W. Tate, T. Thompson.

L.A/C. J. F. Strachan.

A/C.1 S. Littlefair.



FLYING FORTRESS, CIRCA, 1916: Three "field service" Lewis guns formed the armament of this war-time BE2C of No. 4 Squadron. The barrel casings with their internal finning were retained, no doubt, because the machine could not attain a sufficiently high speed to cool the naked barrels. Other points to note are the external aerial drum and the camera held by the pilot.

An All-Canadian Fighter

A REMARKABLY efficient little biplane fighter, produced by the Canadian Car and Foundry Co., Ltd., in Canada ranks as one of the first of Canadian military aeroplanes. It has been designed by Mr. Michael Gregor and despite the fact that it is a biplane with an engine of only 750 h.p. it has a top speed of 298 m.p.h. at 9,500ft. The ratio between top speed and landing speed is better than 5½.

The FDB1, as the machine is designated, is of all-metal construction, the wings and control surfaces being covered with fabric. The top wings are "gulled" into the fuselage which is of semi-monocoque construction with flush-riveted covering.

The cockpit, located aft of the trailing edge, is fitted with a sliding canopy top which can be locked in several intermediate positions.

Two-spar duralumin construction is used for the wings, the upper of which has slots and flaps, the lower wing having only flaps. Ailerons are of the Frise type.

Following American fashion, the split undercarriage is fully retractable into the fuselage.

A 750-h.p. Pratt and Whitney Twin Wasp Junior engine is fitted as standard and drives a Hamilton constant-speed airscrew.

Armament comprises two 0.5in. machine guns, with boxes for 1,000 rounds of ammunition, and two 116lb. bombs.

Data for the FDB1 are:—Span, 28ft.; length, 21ft. 8in.; wing area, 194sq. ft.; weight empty, 3,030lb.; gross weight, 4,250lb.; top speed, 298 m.p.h. at 9,500ft.; cruising speed (68 per cent. power at 9,500ft.), 255 m.p.h.; stalling speed, 57 m.p.h.; rate of climb at 9,500ft., 3,200ft./min.; absolute ceiling, 32,800ft.; endurance 2½ hr.

R.A.F. Flying Accidents

THE Air Ministry regrets to announce the following flying accidents:—

P/O. Hugh Salisbury James, Sgt. Harold Kinloch and A/C.1 Donald Eskburn Shimmin, lost their lives in an accident which occurred at Caenby Corner, Lincoln, on June 2, to an aircraft of No. 144 Squadron. P/O. James was the pilot and Sgt. Kinloch and A/C.1 Shimmin were the other members of the crew.

Sgt. Reginald Charles Phillips died in the Royal Air Force General Hospital, Habbaniya, Iraq, on June 2, as the result of injuries received in an aircraft accident which occurred in Iraq on May 31, 1939. Sgt. Phillips was the pilot of the aircraft. The other members of the crew, L.A/C. William Edward Gates and L.A/C. Ronald Hills, were slightly injured.

THE ROYAL AERO CLUB

News and Official Notices for the Week Ended June 3

Record Month of May

AN increase of more than 1,200 per cent. in the number of Aviators' Certificates granted during the month of May is recorded this year, as compared with 1938, and the total of 584 is the largest ever obtained in the history of British aviation. The comparable figure for 1938 was 48. Not only is the total number increasing, but the rate of increase is also being gradually accentuated. The total figure for 1938, 1,172, has already been exceeded during the five months of 1939, with the figure of 1,681.

If the weather remains favourable, club officials predict a still further increase in the number of certificates granted during the month of June. New aircraft are daily coming into service and the instructing staffs are being steadily augmented. This remarkable expansion has been achieved without checking the amount of flying done by those who already hold certificates, and the month of May may be looked upon as having set the seal upon the success of the Civil Air Guard scheme.

Magyar Pilota Picnic

INFORMATION has been received from the Hungarian Touring Club that the Magyar Pilota Picnic will be held from June 24 to 29 next. An attractive programme embracing an air tour of Hungary, with the two final days in Budapest, has been arranged. Particulars may be obtained on application from the Automobile Association or the Royal Aero Club.

First-class Return

THE first out-and-return British gliding record to be officially recognised is that secured by Sqn. Ldr. W. B. Murray on April 7. Sqn. Ldr. Murray was launched at Ratcliffe Aerodrome in his sailplane and flew to Castle Bromwich, where he was officially observed, then returned to Ratcliffe. This gives a distance of 68 miles. It was not, however, the entire distance flown, for after he had passed over Castle Bromwich he went on to Birmingham, over which city he circled for an hour. Castle Bromwich was revisited on the way back, and then "cloud streets" began to form. These facilitated the return journey, and Sqn. Ldr. Murray landed at his starting point at 3.42, after having been 4¼ hours in the air and reaching a maximum height of 4,700ft.

Conference Contretemps

UNCERTAINTIES of the political situation have caused the Royal Aero Club of Greece to withdraw its offer to hold the annual conference of the Fédération Aéronautique Internationale at Athens in September. Negotiations are in progress to discover another suitable place for the conference.

On the Air Routes

DENMARK: *Danger Area.*—During the periods June 6-8 and 27-30, firing practice will take place in the whole of *Köge Bay*, which is immediately S.W. of *Copenhagen Aerodrome*. Pilots are warned to exercise caution.

FRANCE: *Danger Area.*—Until June 10 a balloon will be flown from *Chavannes* (5 km. N.W. of *Chartres Aerodrome*). Cable unmarked. Pilots are warned to exercise caution.

Saumur St. Florent Aerodrome.—The aerodrome has been abandoned and is no longer available for use.

Nice La Californie Aerodrome.—Work on the aerodrome is now completed.

SWITZERLAND: *Lausanne Blecherette Aerodrome.*—The aerodrome is again fit for use by all aircraft with the exception of the area between the landing circle and *La Blecherette Farm*, which must be avoided.

Aviators' Certificates

No.	Name	Club or School	Date
18,262	Bernard Blake Wicksteed	Horton Kirby Flying Club	9.5.39
18,263	Douglas Herbert Hall	Horton Kirby Flying Club	21.5.39
18,264	Elizabeth Ann Sale	Witney and Oxford Ae. C.	22.5.39
18,265	Edward Dearden Carter	Witney and Oxford Ae. C.	19.5.39
18,266	Herbert George How	Southend Flying Club	23.5.39
18,267	Alfred Gill	Romford Flying Club	22.5.39
18,268	Reed William Gay	Romford Flying Club	21.5.39
18,269	Wilfred Palmer	Cardiff Aeroplane Club	22.5.39
18,270	Alexander Edward Belton	Doncaster Aero Club	23.5.39
18,271	Andrew McTurk Cook	Doncaster Aero Club	23.5.39
18,272	James Alexander Kerr	Southend Flying Club	21.5.39
18,273	Reginald Stuart Hobbs	Bedford Aero Club	23.5.39
18,274	Thomas Elliott Smyth	Bedford Aero Club	23.5.39
18,275	Thomas Foreman Dougall	Newcastle Aero Club	21.5.39
18,276	Norman Atkinson	Newcastle Aero Club	21.5.39
18,277	James Gracie Millar	Border Flying Club	2.5.39
18,278	Thomas Reginald Young	Bristol and Wessex Ae. C.	22.5.39
18,279	Charles Bernard Wimbury	Bristol and Wessex Ae. C.	23.5.39
18,280	Olive Muriel Tremayne Miles	Bristol and Wessex Ae. C.	23.5.39
18,281	Gerald, Marquess of Kildare	Cinque Ports Flying Club	12.5.39
18,282	William Frederick Stone	Thanet Aero Club	22.5.39
18,283	Sidney Bert Harrison	Lincolnshire Aero Club	20.5.39
18,284	John Frederick Barlow	London Aeroplane Club	15.5.39
18,285	Alma Radford Harris	London Aeroplane Club	23.5.39
18,286	Isabel Frances Stone	Tollerton Aero Club	19.5.39
18,287	James Henry Heaneay	Tollerton Aero Club	7.5.39
18,288	David Winks	Scottish Flying Club	19.5.39
18,289	James Guthrie Leslie	Scottish Flying Club	14.5.39
18,290	Victor Biske	Liverpool and District Aero Club	19.4.39
18,291	Alliston Temple Clough Hazledine	Plymouth and District Aero Club	12.5.39
18,292	Leonard John Endicott	Plymouth and District Aero Club	23.5.39
18,293	Vera Madeleine Waldron Axford	Plymouth and District Aero Club	22.5.39
18,294	William Eric Bond	Barnstaple and N. Devon Flying Club.	17.5.39
18,295	Bernard Walter Underwood	West Suffolk Aero Club	23.5.39
18,296	Eric Percy William Bocock	West Suffolk Aero Club	22.5.39
18,297	Kenneth Bernard Fuller	Isle of Wight Flying Club	24.5.39
18,298	Henry Hunter Smith	Norfolk and Norwich Aero Club.	24.5.39
18,299	Reginald Evans	Airwork Flying Club	23.5.39
18,300	Bernard Jackson	Brooklands Flying Club	15.5.39
18,301	Thomas Alastair Sutherland Ogilvie Mathieson.	Brooklands Flying Club	19.5.39
18,302	Frank Bright Robinson	Brooklands Flying Club	21.5.39
18,303	George Eliot Moore	London Air Park F.C.	8.5.39
18,304	Guy Lovell Pickering	London Air Park F.C.	14.5.39
18,305	Ronald Godbold	Insurance Flying Club	19.5.39
18,306	Ival Rhys Webb	Insurance Flying Club	18.5.39
18,307	Warwick Clarence Jewry	Romford Flying Club	23.5.39
18,308	Eric Alexander Hillman Prichard	Redhill Flying Club	18.5.39
18,309	Fred Hartley	Northern Aviation Club	23.5.39
18,310	Edgar Lavington	Redhill Flying Club	23.5.39
18,311	Roland Lionel Pike	Malling Aero Club	21.5.39
18,312	Stanley Arthur Boorman	Malling Aero Club	24.3.39
18,313	James Anderson McHaffie	Lancashire Aero Club	23.5.39
18,314	John Mi ne Greaves	Lancashire Aero Club	23.5.39
18,315	John Ivor Hyde	Cotswold Aero Club	21.5.39
18,316	Lionel Alexander	Redhill Flying Club	16.5.39
18,317	Cecil Harman Baker	Southend Flying Club	25.5.39
18,318	Thomas William George Beveridge	Wiltshire Flying Club	24.5.39
18,319	Bertram Edwin James Hawkins	Wiltshire Flying Club	24.5.39
18,320	Ronald Ernest Ward	Redhill Flying Club	24.5.39
18,321	Diana Gabriel Moran	Redhill Flying Club	23.5.39
18,322	Denis John Adams Brown	Plymouth and District Aero Club.	20.5.39
18,323	Leslie John Parker	County Flying Club	24.5.39
18,324	Terence Norman Alderdice	County Flying Club	24.5.39
18,325	Frank James Sharp	County Flying Club	21.5.39
18,326	Eric Callwell Ferguson	Brooklands Flying Club	18.5.39
18,327	Frederick Ernest Baker	N. Devon Flying Club	21.5.39
18,328	Gilbert Baldwin	South Staffs Aero Club	4.4.39
18,329	Arthur Henry Taylor	Portsmouth Aero Club	25.5.39
18,330	Antony Michael Hale Lewin	Portsmouth Aero Club	25.5.39
18,331	Cyril Anderson Booty	Portsmouth Aero Club	23.5.39
18,332	Sidney John Jones	Yapton Aero Club	25.5.39
18,333	Alfred Kenneth Sherwood	Yapton Aero Club	25.5.39
18,334	Robert William Sandel Morcom	Thanet Aero Club	25.5.39
18,335	Mary Alicia Macfarlane	York and Leeming F.C.	25.5.39
18,336	Geoffrey Berrington Warnes	Yorkshire Aeroplane Club	18.5.39
18,337	Roland Wallingford	Yorkshire Aeroplane Club	21.5.39
18,338	Geoffrey Charles Stonley	London Air Park F.C.	24.5.39
18,339	Sidney John Harris	London Air Park F.C.	24.5.39
18,340	Mary Maud Rolfe	Yapton Aero Club	23.5.39
18,341	Denis Aubrey Staple	Yapton Aero Club	23.5.39
18,342	Stephen Harold Todd	Hull Aero Club	23.5.39
18,343	Frederic Alan Pearce	Midland Bank Flying Club	23.5.39
18,344	Sydney James Henderson	Southend Flying Club	24.5.39
18,345	Frederick George Forshaw	Lancashire Aero Club	20.5.39
18,346	Kathleen Diana Erskine	Sheffield Aero Club	22.5.39
18,347	Roy Christopher Barnard	Wiltshire Flying Club	24.5.39
18,348	Joseph Henry Warner	Wiltshire Flying Club	20.5.39
18,349	William John Corbet	London Aeroplane Club	23.5.39
18,350	Humphrey Edwards Jones	London Aeroplane Club	24.5.39
18,351	Terence Marne O'Neill	London Aeroplane Club	25.5.39
18,352	Cyril Horace Smith	London Aeroplane Club	24.5.39
18,353	Harold Wigley	Midland Aero Club	25.5.39
18,354	Henry Maltas Spencer	Midland Aero Club	22.5.39
18,355	Frank William May	Midland Aero Club	24.5.39
18,356	Peter Alexander Annan	Midland Aero Club	23.5.39
18,357	Rhoda Elinor Heppell	Newcastle-on-Tyne Ae. C.	23.5.39
18,358	Pamela Mary Dorothy Tiarks	Airwork Flying Club	22.5.39
18,359	Kenneth Wyndham Dickens	Airwork Flying Club	25.5.39
18,360	John Lipton	Southend Flying Club	26.5.39
18,361	Ann Josephine Barber-Starkey	West Suffolk Aero Club	26.5.39

FROM the CLUBS and SCHOOLS

LONDON.
FLYING time for last week amounted to 179 hr. 10 min. Miss V. Helmore and Mr. F. A. Rule made their first solo flights. Capt. R. K. Morris has joined the club as a new member.

PORTSMOUTH.
The total amount of flying put in by C.A.G. members during last month was 187 hr. Club members recorded 145 hr.

YAPTON.
The total flying time for the month of May was 224 hr. Twenty-three members of the C.A.G. are now flying solo.

RENFREW.
Members of the C.A.G. section recorded 79 hr. 55 min. during last week. Messrs. W. A. Burns and H. M. Todd have gone solo.

NEWCASTLE-ON-TYNE.
During the last fortnight the club's flying time amounted to 95 hr., while that for C.A.G. members was 232 hr. Mr. H. Stothard has gone solo.

YORKSHIRE.
Flying time for the month of May totalled 711 hr.—a record for a month's flying by the club's aircraft. On June 5, a move will be made into the new club premises.

REDHILL.
Strong north-east winds reduced flying to 83 hr. Mr. J. Harper has gone solo. The club's Puss Moth was flown over for the Dieppe Rally for the week-end.

BRISTOL AND WESSEX.
The flying time during the month of May amounted to 354 hr. Last week the total was 78 hr. 35 min. Messrs. W. L. M. Merritt, J. Winnward and J. Walsh have gone solo.

COTSWOLD.
During the month of May 308 hr. were recorded. Messrs. R. E. Burton, A. Woodward, L. H. Phillips, J. Bennett, A. E. Chapman, W. V. Chatwin and V. Piggott have gone solo.

THANET.
Although 2½ days were unsuitable for flying, a total of 146 hr. was recorded. Miss D. A. Miller, Messrs. E. Geggie, W. R. Paulson, H. N. Williams, H. N. White and S. E. Bailey have gone solo.

EXETER.
Seven fine days enabled 136½ hr. to be flown during the week ended May 29. Miss H M. L. Wilmott went solo. The total flying time of all the Straight Corporation clubs for this week amounted to 588¼ hr.

CINQUE PORTS.
Exceptionally high winds throughout last week reduced the flying time to 19hr. Over 100 C.A.G. members are now under training at Lympne. Since the inception of the scheme 42 have obtained their licences.

WESTON.
There were two days in which flying was impossible during the week ended May 29. In spite of this 71 hr. were recorded. Messrs. T. W. Callingham, D. W. M. Thomas, G. H. Watkins and K. J. Hillier went solo.

HULL.
Over 306 hr. were recorded during the month of May. Messrs. R. D. Stowe, S. Shepherdson, J. C. King, C. E. Macklin, E. Rendall, W. L. Page, A. L. Harrison, F. Rowe, E. E. Hoy and Miss B. M. Spencer went solo.

WEST SUFFOLK.
During the week ended June 4, 30 hr. flying time was recorded. A lecture on the history and organisation of the R.A.F. was given last Thursday evening by Warrant Officer J. Fanning of the R.A.F. Station, Mildenhall.

IPSWICH.
During the week ended May 29, 87 hr. were recorded. Messrs. R. T. Beith and S. J. Garrod have gone solo. The R.A.F. Medical Board is holding examinations for the Reserve School almost daily in the C.A.G. section of the club.

NORFOLK.
During last year 1,600 landings and departures were effected at Norwich Aerodrome. The Civic reception of No. 21 (B) Squadron will be given by the Lord Mayor on June 15, when the Squadron will be entertained to lunch at the club.

HANWORTH.
During last week a total of 330 hr. were recorded. Miss P. Shilstone, the Rev. H. Cuthbertson, Messrs. J. Brigham, L. T. Clark, C. A. Coleman, E. H. Coombs, N. Crofton, W. E. Thorpe, D. A. Walker and D. Allen have gone solo.

SOUTH COAST.
High winds curtailed club flying last week to the extent that only 64 hr. were recorded. The Duke of Richmond and Gordon addressed a parade of the club's C.A.G. section last Sunday. This week-end a cross-country handicap competition will be held for the Gorringe Trophy.

EASTBOURNE.
During last month nearly 300 hr. were recorded. Messrs. N. E. Carter and E. Edgerton have been appointed to the board of management of the club. The aerodrome has been considerably extended, and proposed alterations will increase the available facilities.

LINCOLNSHIRE.
There are now 103 active C.A.G. members attached to the club, the majority of whom contributed to the 305 hr. logged during last month. Miss W. Brompton, Messrs. A. W. Bennyworth, J. F. Outhouse, I. Parke, S. Fisk and S. R. Gibbons have made their first solo flights.

PLYMOUTH.
High winds during the week ended May 29 did not affect the club's flying time, which amounted to 147 hr. Messrs. W. J. Naismith, A. B. Holden, A. L. Hodge, A. L. Chard, C. H. Norman, E. N. Hobbs, C. Norris, G. R. Bailey, F. H. Fell and E. R. Penhale have now gone solo.

BROOKLANDS.
A total of 133 hr. was logged last week. Seven new members have recently joined the club. Mr. J. Sewell is now in charge of flying at Storrington and Mr. C. A. N. Bishop is to start work at the South Coast Flying Club as a part-time instructor in the very near future. The new workshops for the Brooklands Squadron of the A.D.C.C. are now nearing completion.

R.Ae.S. Presidential Elections

AT the May meeting of the Council of the Royal Aeronautical Society, Mr. A. H. R. Fedden, M.B.E., D.Sc., M.I.A.E., M.S.A.E., F.R.Ae.S., was elected president of the Society for a second year of office, October, 1939-September, 1940.

At the same meeting Mr. Griffith Brewer, Hon. F.R.Ae.S., was re-elected as a vice-president for the year October, 1939-September, 1940, and A. V.-M. R. M. Hill, M.C., A.F.C., M.A., F.R.Ae.S., as vice-president for the same period.

Gosport Reunion

LAST year the twenty-first birthday of the Gosport School of Special Flying was celebrated at Brooklands by a dinner given by Capt. Duncan Davis. Those present are not likely to have forgotten the event, but for the benefit of readers it may be recalled that 24 Gosport "veterans" were present at that dinner, and that among the treats was a flying exhibition by the founder of the Gosport system, Col. R. R. Smith-Barry, on his Puss Moth. Those who did not realise that "S-B" has been keeping his hand in nearly died of heart failure. His ability to keep the Puss standing still in the air was incredible.

The second Gosport reunion dinner will again be held at Brooklands this year, and July 22 has been fixed as the date (originally July 15 was suggested, and has figured in our Diary of Forthcoming Events). "S-B" has promised to take the chair, and one may look forward to an afternoon and evening with never a dull moment. All those who attended last year's dinner are, of course, being invited again, but it is felt that there may be others who would like to attend, and who are entitled to do so, but whose addresses are not known to the organisers. Pilots eligible are those who served with, or passed through, the School of Special Flying at Gosport between June, 1917, and the end of the war. Application for tickets should be set nto Capt. Duncan Davis at Brooklands Aerodrome, Weybridge, Surrey.

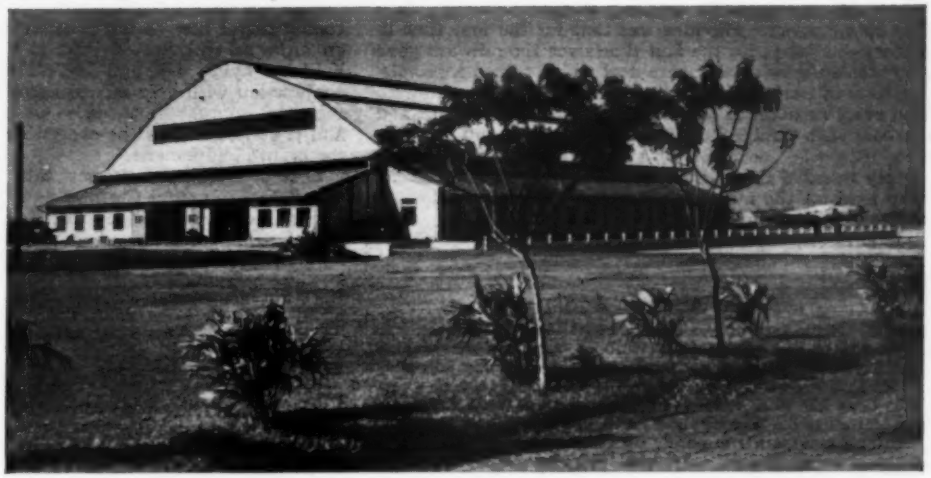
Bigger G.A.P.A.N. Benevolent Fund

A DETERMINED effort is shortly to be made to put the Benevolent Fund of the Guild of Air Pilots and Navigators on a bigger financial basis. A rather novel way of increasing the Fund is to be adopted; it will take the form of a large-scale flying display, details of which will be revealed in the near future. The Benevolent Fund, incidentally, covers all commercially employed pilots and their crews, whether G.A.P.A.N. members or not.

The Brooklands Garden Party

APPARENTLY the Air Ministry has been unable to offer R.A.F. co-operation with the Brooklands Flying Club for their annual Garden Party which was planned for June 17. In view of this fact the committee have decided that it would be best to cancel the party altogether rather than to put up a show which would not have been up to previous standards. Needless to say, the annual "Four Club" competition will be held on June 18 as previously arranged.

COMMERCIAL AVIATION



COLOMBIAN CENTRE: A scene, pictorial rather than educative, at Mangar airport, Barranquilla, which is the base for the operations of the Colombian national company SCADTA. On the right of the picture is one of the four Boeing 247s used by the company.

THE WEEK AT CROYDON

"A. Viator's" Transport Commentary : The Ensigns Again : Whitsun Traffic : False Alarm : A Slight Delay : Making It Difficult

THE first of the modified Ensign-class liners should be delivered to Imperial Airways before these words are printed, and thereafter they are to be handed over at the rate of one a week. They will have a better take-off, with more power and constant-speed airscrews, and the controls are said now to be nicer. We shall know more about it when one of the Senior Imperial pilots has flown the machine through some really rough weather. There is news, too, that some of the Ensigns are to be fitted with Wright Cyclones, which gives more power even than the improved Tiger.

Flight hinted at this some months ago. The change could, I believe, have been made within a very short time of the grounding of the machines and one wonders why it wasn't. Two or three Cyclone-engined Ensigns, available in time for the peak season of air traffic, including Easter and Whitsun, would have been more valuable to Imperial Airways than the whole thirteen delivered just when things are slacking off. Who, I wonder, is to compensate the operating company for the very great loss of trade?

One or two interesting Whitsun figures have come to hand. On the Paris line for the period May 25 to 30, Imperial Airways, with 39 aircraft journeys, carried 644 passengers to Paris and, with 40 journeys, carried 542 passengers back from Paris. Air France are credited, during the same period, with the use of 53 aircraft in each direction, and carried 596 to Paris and 528 from Paris. The Imperial total was thus 1,186 and that of Air France 1,124.

During the same period, another line did pretty well for holiday traffic, and that was to Le Touquet, which is always popular with the fashionable crowd. If the leaders of the alleged smart set decided that Margate was the correct spot to go to, then Margate would be the Heaven on earth of the rest of the crowd. As things are at present though, the Le Touquet run is a good proposition. Imperials carried some 208 souls out and 177 in, and Air France carried a similar number.

I happened to pass through Schiphol, Airport of Amsterdam, on June 1, when the first Amsterdam-Oslo service—which connects with London, by the way—was being inaugurated. It is a K.L.M./D.N.L.V. combined service, and a K.L.M. Douglas D.C.3 started it. Cdr. Smirnoff was the pilot and it was interesting to note that the Norwegian Minister, who flagged the machine away, made his speech in English to the assembled Dutch and Norwegian notabilities, and that Mr. A. Plesman, managing director of K.L.M., replied in the same language.

There was a highly efficient show on the part of the Croydon Fire Brigade last Friday about midday, during the period which the ancient Greeks called the "noontide hush," and which in some other countries, not to mention Government circles here, is "siesta time." The airport fire alarm went off long and loud, and high officials of the airport seized their crash-proof bowlers (into the dome of which, it is believed, cement has been poured over an iron-framework) and rushed to the tarmac.

Apart from a thin column of smoke from behind a policeman's ear (where he had hurriedly parked a cigarette), there was little or no trace of fire and a smell of roast pork was traced to the aforesaid policeman's ear. Anyway, within a remarkably short time the Croydon Fire Brigade arrived, having heard the alarm and acted entirely on their own initiative. A fine effort, which might have made all the difference if there had been need of their services.

What actually happened was that Works (or Bricks) got his pick under a cable, during a spot of the usual devastation which goes on all the time, and, like an outsize thrush on a lawn with a stubborn worm, he just sat back and tugged until he had disinterred a fathom or so, which set the first alarm going.

The Flamingos

I hear that the first of the D.H. Flamingos will leave the factory shortly. The first two, it is rumoured, are destined for Jersey Airways, the next one for the Air Council, the third for the Air Ministry for tests, the fourth for H.M. the King, and then an unspecified number of them for Railway Air Services.

Talk about robins building nests in aircraft, I should think a couple of mares have nested by now in the ex-International Air Freight machines, which were bought by the Air Ministry six months or so ago and have been mouldering in hangars at Croydon ever since. They were needed for urgent and immediate conversion into class rooms for training wireless operators—or so one was told. No doubt the pupils' desks have been delivered, but some hitch has occurred in placing the contract for the porcelain ink pots. Alternatively, zeal may have outrun discretion, and ten thousand ink wells of the wrong size have been

delivered, so that they either drop through the holes or won't go into them at all. Anyway, it will probably need an expert squad to clean out the bats and mice, and other such small deer, from the fuselages.

I was talking the other day to a high municipal official, whose city has spent an amazing amount of money on a first-class airport. His idea was that for the first time in history—anyway, for the first time since the railways gave the canals the original square deal which ruined a promising form of transport—an inland city devoted to commerce had every prospect of becoming, in future, a great port and harbour with "ships" of all nations flying to and fro. He is a man who looks ten or twenty years ahead and he deeply resented the attitude of H.M. Customs and Excise, who tend, at the moment, to make it difficult for foreign aerial merchant shipping.

It is interesting to look twenty years ahead—to when, for example, India may be a day only from England by air. Take one small example—the mango, which is a delicious fruit practically unknown here save for odd and more or less experimental air sendings. It won't travel by boat, but who will be so bold as to assert that the mango, or some other Eastern fruit, may not become as common over here as the banana? Any such demand for an airborne fruit would lead to special freighters being built and flying night and day. The big demand would, in conjunction with ever increasing economy of flight due to technical improvements, cause freight costs to come down and the mango would be everywhere, cheek by jowl with the orange and banana.

Should anything of the sort take place in the fulness of time, we may expect Customs and Excise to issue a White Paper stating that all the credit is due to them because of the way they have always encouraged international aviation.

The Atlantic Again

WHILE the first of the Boeing boats, *Yankee Clipper*, was making her return from Europe—via Bermuda because of strong headwinds—the *Atlantic Clipper* crew was preparing to take off for Europe on the third semi-commercial crossing. This boat left Port Washington on Saturday, May 27, reaching Marseilles on May 29, and Southampton on May 30.

After a long period of purely mail carrying and experimental Atlantic flying, D.L.H. may, next year, be prepared to carry passengers. Blohm and Voss, the Hamburg constructors, are developing a six-engined machine with an all-up weight of about 40 tons, and this should be ready by the middle of next year. It is designed to have a maximum range of 4,200 miles, and it is proposed to fly it non-stop between Lisbon and New York

Considering the Passenger

IN Railway Air Services' summer time-table the services include a daily direct run between London, Manchester, Liverpool and Glasgow, as well as four services between Liverpool, Manchester and London.

The first of these, in a southward direction, has been timed to give adequate Continental connections at Croydon and will, at the same time, permit a business passenger to stay eight hours in London. In the reverse direction the use of the first and last services will allow more than six hours' time in Liverpool and seven hours in Manchester. Now, therefore, the comparatively short run between London and the north Midlands can be considered to be a reasonably useful one, and not merely so for the benefit of those going over to or returning from the Continent. At least the Manchester Chamber of Commerce should be better pleased than they had reason to be in previous seasons.

Testing the New Boats

CONNEMARA, one of the strengthened "C"-class Short boats, is now in the course of a 400-hour series of flights which are being carried out in order that the new Perseus XIIc sleeve-valve engines may be fully tested. The pilot in charge is Capt. J. C. Kelly Rogers, and advantage will also be taken of the 70,000 miles of flying involved to provide additional radio and navigational training for pilots and operators.

On each trip Capt. Kelly Rogers will be accompanied by one or more supernumerary pilots taking a post-graduate course. At the same time, of course, there will be opportunities for testing the radio facilities in various parts of the country, and particularly those at Southampton, Croydon and Foynes. Last week *Connemara* had already completed 150 of the 400 hours, and it is averaging, according to weather conditions, from eight to fifteen hours' flying in every twenty-four hours.

Although the output of the Bristol Perseus XIIc fitted to the strengthened "C"-class Short boats is rather lower than that of the Pegasus fitted to the previous type of Empire boat, this new machine has a slightly higher maximum speed and a similar cruising speed. The curious comparison in performance has mystified not a few people, and it is explained by the fact that the reduction in power has been offset by an aerodynamic advantage in nacelle form, the Perseus cowling being some three inches smaller in diameter than that of the Pegasus.

Otherwise the *Cabot* class boat is almost identical with its predecessor, the basic design and overall dimensions being unaltered. A stiffer structure and heavier gauge sheeting for the stressed skin have, however, meant that the hull and wings are a good deal stronger. As a result of tests it was decided, since the initial flight of *Cabot* late last year, to fit constant speed airscrews in place of the original two-position type. These c.s. airscrews have spinners incorporating de-icing slinger rings so that, with the new shrouded type of exhaust manifold, the new engine installations are easily distinguishable.

The three "G" class boats, the first of which should be launched within the next week or two, are, of course, fitted with Bristol Hercules sleeve-valve radials rated at a maximum output of 1,380 h.p.

Fifteen Years

ON June 2, A.B. Aerotransport, the Swedish airline company, celebrated its fifteenth birthday. The first flight was made on June 2, 1924, with a single-engined Junkers floatplane, flying from Lindarängen, Stockholm, to Helsingfors. During the first five years, the company transported over 54,000 passengers and 315,000 kilos of freight and mail. During the next five years the pasengers numbered 115,000, whilst the mail and baggage amounted to 1,150,000 kilos. The regularity was already remarkably good—on the Malmö-Amsterdam line 98 per cent., and on the Stockholm-Helsingfors line, 98.4 per cent. To-day the company has carried 320,000 passengers, of which only one has been killed, with 6,500,000 kilos of mail and luggage, over 12,200,000 kilometres.

Five of the company's pilots, i.e., K. G. Lindner, E. Roll, G. Lindow, M. Lindholm and S. Ahblom, are mileage millionaires, and the flying staff of the A.B.A. is considered to be amongst the best in Europe. The conditions under which the pilots fly in the winter are the most difficult that one can encounter in Europe, because of the weather then prevailing in Scandinavia. In this connection it might be of interest to recall the enormous difficulties that the company has encountered as far as ground organisation and aerodromes are concerned. The aerodrome at Bromma, for instance, although still not very easily approached, is one of the most outstanding achievements in the world, considering the fact that several hills had to be blasted away before the runways could be laid out. Last week the Swedish Press was full of laudatory articles about the company's founder and present managing director, Capt. Carl Florman, his second in command, P. A. Norlin, commercial manager, and K. Lignell, technical manager.

Baltic Expansion

KNOWN as A.G.O., a new Baltic airline company has been founded in Estonia. Two Junkers Ju. 52s have been ordered for delivery in the autumn, from which date A.G.O. will add another daily schedule on the Tallinn-Helsinki run, and a direct service between Tallinn and Stockholm. During the summer season the company will start two new interior services, Tallinn-Pernau and Tallinn-Narva.

On June 1, in conjunction with the opening of Oslo's land airport at Fornebu, D.D.L. started a new service between Aalborg and Kristianssand, linking up with the Aalborg-Copenhagen line at one end, and the Kristianssand--Stavanger-Haugesund-Bergen-Oslo line at the other. The day also marked the opening of the new Trans-Norwegian route from Oslo, via Bergen, Aalesund, Kristiansund, Trondheim, Bronnoysund, Sandnessjoen, Bodo, Svolvær-Narvik, Harstad and Tromso, to Kirkenes, in the sub-Arctic region of the country, while the Swedish A.B.A. inaugurated a new service from Stockholm, via Copenhagen and Berlin to Zürich.

Fornebu airport is far from being completed. It is situated on a mountain plateau and it has so far taken 265 tons of dynamite to blast away over one million cubic metres of rock in order to make the site useful. The present maximum runway length is approximately 800 metres, but by this time next year this will have been increased to 1,400 metres.

A New Bloch

AIR FRANCE technical chiefs in Paris are said to be enthusiastic about the new 33-passenger machine by Marcel Bloch—the Bloch 161—a flying model of which has during the past few days carried out a number of tests at Chalais Meudon. This prototype differs substantially from its precursor the 160, and it is stated that a whole series of them will be ready for service by the beginning of 1941.

The Bloch 161 will have four engines and weigh 37 (metric) tons. It will carry between 33 and 35 passengers. Its economical cruising speed will be 220 m.p.h. for a range long enough to enable express non-stop services to be included on routes where two or more stops are now normally made.

Whitsun Record

MOST outstanding of the various figures which have so far been given or guessed at for the air traffic during the Whitsun holiday period are those of Western Airways. In five days this company carried 2,555 passengers, of which only 712 were joy-riding. The Weston-Cardiff ferry carried 1,622. During the period four new services were started. Even on these the traffic was fair, seventy-four being carried between Bristol and Cardiff, sixty-five between Cardiff and Swansea, sixty-nine between Swansea and Barnstaple, and thirteen between Barnstaple and Penzance. The Swansea-Barnstaple journey, which takes twenty-five minutes by air, involves nine hours' travelling by train. The total figures show an increase of 250 per cent. on those of last year, which were already extremely good. So much for frequency and comparatively low fares.

Opening Up West Africa

FOR some years now, a flying club at Luanda, in Portuguese West Africa, has been in operation with D.H., Tiger, Leopard and Puss Moths—the latter privately owned—a Cessna, and three Taylor Cubs. The chief instructor, Capt. Joaquin de Almeida Balthazar, has also been flying, since August of last year, a weekly mail service with the Puss Moth between Luanda and the Aeromaritime terminus at Pointe Noire.

The State Railway administration of the country is now going ahead with the development of air services, and have recently purchased three six-passenger De Havilland Rapides, which should be delivered about the middle of next year. They will be based at Luanda, and will first take over the Pointe Noire service, afterwards operating south to Lobito and Mossamedes, then inland to Lubango and Huambo, which is on the railway to Beira. Later on, there will be an extension to Luao, and in about a year it is hoped that the air route circuit will be complete—with D/F stations at Luanda, Lobito and Nova Lisboa. The chief pilot of the railway air service will be Capt. Balthazar. His assistants will be R. D. Barros, F. Branco and P. Gomes.

Contact at Croydon

EARLY this week work was started on the installation of flush, or contact, lighting at Croydon. This will be carried out, as at Heston, in a series of sections, so that normal flying operations will not be unduly impeded, though the ultra-high-frequency blind-approach equipment will be inoperative until the whole strip has been completed.

In the meantime the main approach beacon will be repositioned and reorientated to give a longer landing run and to make the equi-signal line coincide with that of the contact lighting strip. The inner marker, too, will be moved further to the north to bring it into line. As at Heston, the line of contact lights will be preceded by parallel lines of mercury vapour and sodium lamps.

The actual arrangement of the contact lights will be rather more elaborate than that at Heston or Ringway, a transverse line of lights being used to mark the end of each coloured section. After he has passed the threshold sodium and mercury lamps, the pilot will see the line of fifteen green lights ended by a cross-line of green lights; then eight pairs of white lights with another white cross-bar; and, finally, fifteen pairs of red lights ending in a cross-line of red lights.

While the blind approach equipment is out of action at Croydon, the Lorenz installation at Heston, which has not been much in use during the past year, will be made available. In the circumstances it will be operated temporarily on the Croydon frenquency.

Derby's Airport

PREVIOUS to the official opening of the new Derby airport at Burnaston, which, as already announced, will be carried out by Sir Kingsley Wood on Saturday, June 16, there will be an aviation banquet at the Rolls-Royce Works. This is being given by the Corporation of Derby and some 350 guests are expected to be present.

After the opening ceremony on the Saturday, there will be the usual flying events, but the Fleet Air Arm will be seen for the first time at a civil air meeting. A squadron of Blackburn Skuas will show how "dummy" deck landings are taught, while there will be displays by fighters, bombers and Army co-operation types, as well as a demonstration of barrage balloons. On the civil side Imperial Airways will probably be sending one of the new strengthened "C" class type boats, while the C.40 jump-start Autogiro will also be demonstrated. Private owners are invited to take part in the usual arrival competition, the zero hour for which is between 11.30 a.m. and 12.15 p.m.

The D.C.6—and the Second Stratoliner

A WEEK or two ago we gave details of two new machines which the Lockheed Corporation are developing for air transport work. We now learn that the Douglas Company is also working on the design of a new medium-sized four-engined civil machine with an all-up weight of about 30,000lb. This will be designated the D.C.6, will be slightly larger than the D.C.3, and will, of course, have a tricycle undercarriage. Presumably, at this all-up weight, the four engines will be Wasp Juniors.

The idea behind all these new projects, including to some extent that of the D.C.5, is to meet interim air line needs before such large types as the Boeing Stratoliner and the Douglas D.C.4 become reasonable from an economic standpoint.

Incidentally, the second Boeing 307, or Stratoliner, has recently been going through further test flights in the hands of Mr. E. T. Allen. The first 307, it will be remembered, was over-stressed and suffered structural failure in an extremely severe pull-out. At the time of the accident, which involved the death of, among others, Mr. P. Guilonard, of K.L.M., the high-altitude cabin equipment, which gives the machine its name, had not been installed, and this remains to be tested during the flight programme with the second machine.

MASTER INSTRUCTORS

IN last week's issue the previously rumoured fact that the G.A.P.A.N. have decided to institute a Master Flying Instructors' Diploma was officially, though briefly, announced. The main objects of the introduction of this Diploma are to give fully qualified instructors the same prestige as that of transport pilots who have the Master Pilot's Licence; to pave the way for the official recognition of a higher status among instructors; and to enable thoroughly experienced instructors to have their qualifications recognised and recorded for reasons of employment or otherwise.

Before the formation of the Guild in 1929, no standard of qualification for instructors existed, and the introduction of a certificate for this purpose was their first job of work. In 1931 the certificate was officially recognised by the Air Ministry, and the necessary endorsement was made compulsory under the A.N.D. In more recent years the necessary standard has tended to become a minimum, and the Guild has considered the idea of further grading. The first move in this direction was the institution of an assistant instructor's endorsement. It was made necessary largely by the fact that the increase in training, both at Volunteer Reserve and Civil Air Guard centres, had shown a considerable shortage of the necessary training personnel. This was, however, a grading downwards, and the idea of the new diploma is not only to equalise the balance between transport and instructor pilots, but to increase the standards of instructional efficiency.

There are actually two new certificates, one known as the Master Flying Instructor's Diploma and the other as the Extra Master Flying Instructor's Diploma. The former has already been awarded to any British subject who, on February 1 this year, had an instructor's certificate; has completed 2,500 instructional flying hours; had been engaged as an instructor within the British Empire for a maximum of five out of the preceding eight years; and had a satisfactory record in the matter of accidents or complaints. Additional applications will be considered in March and September of each year.

The Extra Master Flying Instructor's Diploma will be awarded to instructors of great experience as the highest honour the Guild can confer in connection with instruction, and this may be awarded to anyone in the world.

THE INDUSTRY

Reorganisation of Parnall Aircraft Ltd.

AN extraordinary general meeting of the shareholders of Parnall Aircraft, Ltd., is to be held on June 26, when the directors will propose an increase of the share capital from the present £450,000 to £750,000, and an alteration in the articles of association modifying the company's borrowing powers. It is proposed to create 1,200,000 new ordinary shares of 5s. each and to offer them to the shareholders at 5s. 6d. each, in the proportion of two new shares to every three existing shares. The Prudential Assurance Co., Ltd., has agreed to underwrite the whole of the new issue for a commission of three-halfpence per share.

In a letter to the shareholders the chairman of the company, Sir Louis Vaughan, explains that the company has acquired three further concerns: Powered Mountings, Ltd., Magnal Products, Ltd., and Yate Development Co., Ltd. Powered Mountings, Ltd., holds the rights in the Frazer-Nash patents for tanks and armoured cars (all rights for aeronautical purposes are held by Parnall Aircraft, Ltd.); Magnal Products, Ltd., was formed to safeguard the supply of light alloys, and the foundry is situated near Bristol, within a few miles of Yate; Yate Development Co., Ltd., is a housing concern, and will provided living facilities for the employees.

At a dinner given last week to make these announcements, Capt. E. Grattan Thompson recalled that the beginning of what he very descriptively termed "turretry," was to be found in the connection of himself and of Capt. Frazer-Nash with the development of the Constantinesco fire-control gear during the war, 1914-18, when both were in the Air Ministry. They realised, soon after the war, that manually operated guns would have to be superseded by power-operated guns when aircraft speeds went up to 200 m.p.h. By 1931 they had evolved the Nash and Thompson power-operated gun gear, and put the scheme up to the Air Ministry. The first turret was designed in 1932. Not until 1935 was one installed in a Hawker Demon and tested by the R.A.F. A small order was then placed, from which had since been developed the multi-gun turrets now in increasing use on Service aircraft.

Capt. Grattan Thompson said it was fair to claim that Parnall Aircraft, Ltd., had created a revolution in air armament equal to that of the Constantinesco of the late-war period. He thought the financial arrangements to be suggested at the meeting on June 26 would satisfy the problem of making the fixed capital structure of the company properly related to the output demand over the next five years, leaving the company with a permanent capital structure which it could profitably employ in normal years.

By way of explanation he said that the type of infinitely variable gear employed in the operation of armament would certainly have a great many applications in commercial spheres, so that if the present demand for "turretry" should dwindle, there was hope of developing commercial business.

PARACHUTE PRODUCTION: A busy scene in the canopy department of Irving Airchute of Britain, Ltd., at Letchworth, where large Air Ministry orders are being fulfilled.

The Rolls-Royce Scottish Factory

A PARTY of Rolls-Royce officials recently visited Glasgow, and it was learned from them that work on the site of their vast new aero-engine factory, to be established on the industrial estate at Hillington, will begin almost immediately.

Sir Steven Bilsland, chairman of Scottish Industrial Estates, Ltd., gave a dinner at which he introduced a number of Glasgow and West of Scotland industrialists to the visitors from Derby, and the following evening the latter entertained local trade union officials and discussed with them employment prospects at the new factory.

The Rolls-Royce representative included Mr. E. W. Hives, who will be deputy controller of the new factory; Mr. Haldenby, assistant; Mr. Robins, works engineer; Mr. Philips, architect; and Mr. Buckie, consulting engineer.

In an interview with our Glasgow correspondent, Mr. Hives said that the immediate purpose of their visit was to give final consideration to the lay-out of the factory site so that work on the roads could be started immediately. There was still a lot of preliminary work to be done, he added, but they would look around for temporary premises in which to start work on jigs and tools during the next few weeks. It was their desire to have the jigs and tools available when the factory was built and ready for production, and for this immediate work mechanics would be needed. The number of men to be employed in the temporary premises would depend on the delivery of the machine tools. So far as employment at the new factory was concerned, Mr. Hives thought that by this time next year between 2,000 and 3,000 men would be working there.

ROOF-TOP TRANSPORT: How an Avian fuselage arrived at the Gatwick shops of Airwork, Ltd., for repair. It departed homewards by the same method.

In Retrospect

IT comes as a refreshing change to glance through the pages of a brochure recently issued by a London firm of aircraft suppliers which has been established for over 150 years. The firm—Mosers, Ltd., of Borough High Street, London, S.E.1—started in the year 1787 to deal mainly in ironware. Proportionately, its connection with the aircraft industry is equally old-established. In particular, it has been doing business with Short Bros., Ltd., of Rochester, from that company's early Battersea days. To-day, Mosers are one of Shorts' principal suppliers, both for commercial and A.I.D.-released parts. Their activities include not only the supply of aircraft steels, but also A.R.P. material.

Laminated Plastic Sheets

IT is many years since the first Jersey Airways services were started. Of the far-seeing people who pioneered that very successful venture many are still actively connected with the flying world. One in particular, Mr. W. L. Thurgood, has decided to strike out anew, but this time in a somewhat different sphere.

For three years Mr. Thurgood has been interesting himself in the field of plastics. Normal commercial requirements were catered for at his extensive works at Ware, Herts, but he is now actively participating in the application of his company's products to the aircraft industry. This company, which is known as Warerite, Ltd., of Watton Road, Ware, specialises in the manufacture of synthetic veneers, thermo-setting glues in sheet form, and decorative laminated plastic sheets. Research work is now being carried out, under the leadership of Mr. F. S. Deutsch, who was for many years with H. Roemmler A.G. (the German plastic specialists), into the almost limitless field of plastics and their application to aircraft.

The plant at Ware includes an intricate impregnating and drying machine, some 120ft. in length. This machine draws paper or fabric sheets from suitably mounted rolls through an impregnating bath of synthetic resin of the phenol- or urea-formaldehyde group. The material is then slowly drawn through a 100ft. drying cupboard in which vertical jets of hot air keep the material supported throughout the entire length until it is rewound on rollers at the far end.

To produce a sheet of laminated plastic material, such as would be used for veneer, some twenty sheets of paper treated by the impregnating machine already described are stacked one on top of the other and loaded between sheets of highly polished stainless steel sheets into one of three 2,000-ton presses. The presses are equipped with several platens or tables, each of which is drilled and cored for steam passages. When the press is closed the temperature is raised and the material is "cooked" for a given length of time. The temperature is then reduced by passing cold water through the platens before the pressure is reduced.

The back of the veneer, which has a highly polished face caused by the pressure against the stainless steel sheet, is then scratched on a special machine ready for glueing to plywood. The finish is hard—almost metallic—and if a thin sheet of aluminium is incorporated in one of its laminated sections it is cigarette-burn-proof.

The applications of this particular material in commercial aircraft are many, if only on the score of weight. Plastic materials made to other specifications open up a field which is almost limitless and one in which Warerite, Ltd., are now ready to co-operate with aircraft manufacturers.

This 2,000-ton Fielding and Platt press, at the works of Warerite Ltd., is equipped with temperature-controlled platens between which are placed the layers of laminated plastic material.

Production Down Under

EVERY effort is being made by the Australian Government to have its aircraft industry ready for production by the beginning of 1940. Jigs and patterns costing £250,000 have been ordered from Great Britain and will be distributed to the annexes of the railway workshops and to private factories in which the Bristol Beaufort will be built.

In the meantime, the De Havilland Aircraft Company's Sydney factory is building twenty Tiger Moths for the R.A.A.F. Incidentally, it has received an order for 100 D.H. Hamilton airscrews, to be made in a new factory. Gipsy engines will be manufactured under licence by the Commonwealth Aircraft Corporation.

New Bristol Engines

CONTRARY to an impression which was given in a paragraph last week, the Bristol Hercules IV and Taurus II two-row, sleeve-valve engines are already in quantity production. Hercules IVs are installed in the Short G class flying boats for Imperial Airways, the first of which is nearly ready for launching.

* * *

The British Aluminium Co., Ltd., has opened a branch office and warehouse at Abbey Buildings, Middle Abbey Street, Dublin, under the management of Mr. D. E. Cottrell. Telephone: Dublin 22966.

COMPANY REGISTRATIONS

The "objects" of new companies, usually set out very fully for official registration purposes, are considerably abbreviated below for reasons of space.

BIRD INSTRUMENTS, LTD.—Private company, capital £1,000. To manufacture and deal in navigational instruments. Directors: C. R. Fry and W. G. Bird. Registered office: 1c, King Street, London, S.W.1.

METAL TUBES, LTD.—Private company, capital £8,000. Metal press work and plastics, general metal work, etc. Directors: K. Bud, H. A. Lippmann, J. S. Clark, Lord Sempill. Registered office: 11, Fitzroy Square, London, S.W.1.

BOOTHBY AND THOMPSON, LTD.—Private company, capital £500. Dealers in components for air and other craft. Directors: Capt. F. L. M. Boothby, J. A. Thompson. Registered office: 63, Coleman Street, London, E.C.2.

G. RALSTON AND CO., LTD.—Private company, capital £6,000. To design, manufacture, operate and repair aircraft watercraft and other vehicles. Directors: G. Ralston (Curzon Road, Weybridge, Surrey), Mrs. G. Ralston.

BORDER FLYING SERVICES, LTD.—Private company, capital £5,000. To manage a Reserve School at Carlisle and to manufacture and deal in aircraft. Directors: J. Westoll, R. Ellis, C. F. Hughesdon, G. L. S. Lightfoot. Solicitors: Saul and Lightfoot, Carlisle.

GANTON FLYING CLUB, LTD.—Private company, capital £5,000. To promote and develop the science of aeronautics. J. R. Micklethwaite signs as director. Solicitors: G. Brown and Elmhurst, York.

HARGREAVE AVIATION, LTD.—Private company, capital £100. Manufacturers of precision and navigation instruments. Directors: J. G. Hargreave ("Wayside," Kings Langley), D. C. Williams, W. P. Ashworth.

AERO INDUSTRIES, LTD.—Private company, capital £100. Manufacturers and dealers in aircraft. Directors: A. G. A. Fisher, E. H. D. Spence, F. J. J. M. ten Bos. Registered office: 14/16, Regent Street, London, W.1.

BEATSON BROS. AND CO., LTD.—Private company, capital £10,000. To acquire the business of manufacturers of rivets and aircraft parts now carried on as "Beatson Bros." Directors: R. W. Girdwood, F. Beatson, C. H. Beatson. Solicitors: Lucas and Padley, Sheffield.

FARNBOROUGH ENGINEERING CO., LTD.—Private company, capital £10,000. Manufacturers of valves, tools, piston rings and accessories relating to I.C. engines. Directors to be appointed. Solicitors: Ernest Bevier and Sons, 200, Brent Street, London, N.W.4.

NUTTER AIRCRAFTS, LTD.—Private company, capital £1,000. Manufacturers of aircraft components and aircraft. Directors: P. Thomason (212, Upper Chorlton Road, Manchester, 16), P. M. Thomason, B. R. Nutter.

ROBERTSON ENGINEERING CO., LTD.—Private company, nominal capital £20,000. To adopt an agreement between Robertson Coolers, Ltd., J. H. Robertson and Philco Radio and Television Corporation of Great Britain, Ltd., and to carry on aeronautical and general engineering. Directors: C. C. Rattey, J. H. Robertson, L. D. Bennett, W. A. Stone. Solicitors: Lawrence Mosser and Co., 16, Coleman Street, London, E.C.2.

HUNTINGDON AERO CLUB, LTD.—Private company, capital £1,000. To give flying instruction to members and others. Directors: W. J. Curtis, W. Smyth, G. Mills. Registered office: 18, Hartford Road, Huntingdon.

ARPIN AIRCRAFT MANUFACTURING CO., LTD.—Private company, capital £10,000. To manufacture and deal in aircraft of all kinds. Directors: S. J. Cox, M. B. Arpin. Registered office: 8-9, Long Acre, London, W.C.2.

ROLLS-ROYCE (FOREIGN), LTD.—Private company, nominal capital £10,000. To manufacture and deal in internal combustion engines, land, air and water vehicles, armaments, etc. Directors: Lord Herbert Scott, A. F. Sidgreaves, W. Cowan, E. W. Hives, H. Peake and Capt. E. C. E. Smith. Solicitors: Claremont, Haynes and Co., Vernon House, London, W.C.1.

MODELS

By M. R. KNIGHT

Wilfred II—so called from its rabbit-like appearance when the airscrew blades fold back for the glide—seen with the single-front-wheel undercarriage retracted. Note the wheels in the bases of the fins.

"*Flight*" photograph.

Retractable Tricycle

THREE years ago Mr. W. L. Henery, of The Model Aircraft Club, London, fitted the first folding airscrew to his model, a description appearing in *Flight* of June 4, 1936. A year later he devised a simple retracting undercarriage, which was held extended by the weight of the model, a rubber-band folding it as soon as the machine became airborne.

The high-wing model here described retains the folding airscrew, and has, in addition, a single forward wheel which is mechanically retracted, thus obviating the danger of premature retraction through the model being momentarily lifted by a gust. Ground stability is contrived with the aid of a small wheel in the base of each fin.

Without any previous test flights, Mr. Henery flew the machine in the recent Wakefield Trials, described below, and in a boisterous wind achieved a flight of 86 sec. Two days later, a change in trim resulted in a flight of 3 min., the model appearing to glide almost on an even keel.

The wing-span is 43in., the area 204sq. in., and the chord is reduced from 6in. to 3in. by curving the leading edge. Rubber bands pass through wing and fuselage to couple them. The dihedral angle is 7 deg., and the aerofoil-section an approximation to Clark Y.

Four longerons and two stringers, with paper-covered balsa bulkheads, comprise the fuselage, which is of hexagonal cross-section except for the circular forward portion. The length is 32in., and the maximum depth 4in. It is covered with doped Jap silk. The bamboo undercarriage strut carries a 1¼in. balsa wheel, and is retracted by the method shown in the sketch below.

An airscrew with a diameter of 18in., a pitch of 21in., and a blade-width of 2⅜in. is turned by 18 strands of ⅛in. x 1/24in. rubber. Centrifugal force is still strong enough to hold the pivoted blades outstretched when the power ceases, and they must be brought to a standstill by a wire trip actuated by the lessened tension of the rubber before the airflow can fold them.

The tailplane is 17in. in span, tapers in chord from 4in. to 3½in., and is 62sq. in. in area. Clark Y section is employed.

The total weight is 10·9*z*. Taking the thrust-line as the datum, the wings are set at 4 deg. positive incidence, and the tail at 1 deg. positive, the wing leading-edge being 2⅛in. above the datum.

Wakefield Cup Challengers

THE British team which will compete for the Wakefield Cup in New York on August 6 was chosen in eliminating trials held by the S.M.A.E. at Fairey's Great West Aerodrome on Whit-Sunday. Out of 435 entrants, there were no fewer than 380 starters, including six women. A very gusty wind ensured considerably fewer finishers!

The following won places in the team, the Barnard Shield going to the first mentioned: F. J. Almond (N. Kent M.A.S.), N. Lee (Halifax M.A.C.), R. Copland (Northern Heights M.F.C.), R. T. Parham (Edgware M.A.C.), L. Stott (Halifax M.A.C.), and Mr. Hill (Bournemouth M.A.S.). Mr. Copland is the holder of the world duration record of 33 min.

At one time Wakefield design seemed likely to stagnate, a strong body of opinion favouring the tapered shoulder-wing monoplane with elliptical fuselage as the ideal application of the "8/200" formula (8 oz. min. weight, and 200 sq. in. wing-area, with a plus or minus tolerance of 10 sq. in.). This year, while there was no biplane entered for the trials, well-nigh every conceivable type of monoplane was entered, including one of the tailless type, which achieved a flight duration out of all proportion to the restricted length of rubber occasioned by the abbreviated fuselage.

There were parasols, high-wings and shoulder-wings in large numbers, with rectangular, elliptical, circular, hexagonal and diamond fuselage cross-sections. Single, twin and triple fins were in evidence, and single- and two-bladed airscrews, folding and non-folding. One mid-wing model overcame the problem of securing adequate wing-anchorage without fouling of the rubber motor by fairing the wings into perfectly streamlined "blisters" on the sides of the fuselage. There was even a twin-fuselage low-wing model.

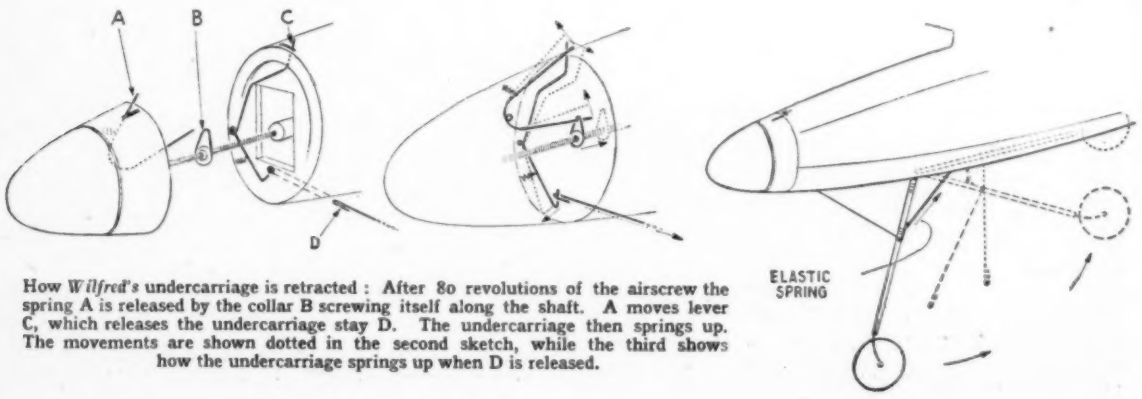
Constant-chord wings and "slab-sided" fuselages shared with "undercambered" tapered wings and multi-stringer oval fuselages the honours of inclusion in the chosen team. From which it would appear that, granted a sound design, and apart from helpful up-currents, the factors most conducive to success are accurate construction and achievement of the ideal trim.

Petrol-model Contest at R.A.F. Station

JUNE 11, at CRANWELL R.A.F. AERODROME (by permission of Air Vice-Marshal J. E. A. Baldwin, C.B., D.S.O., O.B.E.), the S.M.A.E. petrol-model contest for the *Flight* Cup. Cars from N. or S.W. via Newark and the Sleaford road until direction signs are met; from S. by Gt. North Road via Colsterworth, turn right immediately under railway bridge, to Ancaster, thence by signs; from E. to Sleaford, thence by signs; from W. to Grantham, thence via Ancaster-Sleaford road until signs are met. Trains leave King's Cross at 7.28 a.m. (change Finsbury Park) and 10.10 (no change), arriving at Grantham at 10.28 and 12.25. From Leeds and York 11.0, Doncaster 11.48, arriving Grantham 1.16. From Nottingham (Victoria) 12.12, arriving Grantham 12.56. Buses will meet above trains at Grantham. Refreshments obtainable on the aerodrome.

* * *

JUNE 18, at FAIREY'S GT. WEST AERODROME, the seventh Gala of the Northern Heights M.F.C. Noted for large attendance and diversity of models. Included in the eight contests is one for flying scale-models (for the *Flight* Cup).



How *Wilfred's* undercarriage is retracted: After 80 revolutions of the airscrew the spring A is released by the collar B screwing itself along the shaft. A moves lever C, which releases the undercarriage stay D. The undercarriage then springs up. The movements are shown dotted in the second sketch, while the third shows how the undercarriage springs up when D is released.

SERVICE AVIATION (CONTINUED) — FOREIGN NEWS

Finland Tests Fokkers

TWO Finnish pilots, visiting the Fokker works to test the T.8-W (illustrated on this page), recently availed themselves of the opportunity to do some additional flying on the G-1 twin-engined attack machine and dive bomber. In a dive of 9,500ft. the machine reached 400 m.p.h., though the speed can be limited to 310 m.p.h. by using the air brakes.

Vultees in Demand

HAVING lately completed an order for forty V-11GBT Cyclone-engined attack bombers for Turkey, the Vultee Aircraft Company is now building twenty-six somewhat similar machines for Brazil. The latest Vultee model has been produced for the U.S. Army Air Corps and is powered with a Pratt and Whitney Twin Wasp engine of over 1,000 h.p.

Effectiveness of Bombing

A WRITER in our French contemporary *Les Ailes* has discussed the effectiveness of aerial bombing with officers and men of the Spanish Republican Forces which recently retreated into France.

He states that a civilian population is completely demoralised when exposed to high explosives. The 500 kg. (1,100lb.) bomb will cause the collapse of any adjacent building by blast; rescue work is rendered very difficult by the subsequent use of fragmentation bombs.

Troops in trenches can be completely demoralised by subjection to heavy and continuous bombardment, and, the writer says, that even if the actual loss of life is relatively small they are incapable of offering any resistance and a trench can be taken without a shot being fired. Troops in the open, especially mechanised columns on roads, are extremely vulnerable to machine gun attack from the air and to the effect of small fragmentation bombs. The ordinary soldier with field equipment is incapable of any effective reply.

German Equipment and Strength

ACCORDING to Italian sources, the first-line strength of the German Air Force amounted to 3,000 machines in June, 1938. The principal types then in use are given in the following table:—

Duties	Type	Top speed m.p.h.	Range miles	Bomb load lb.	Armament*
Bombing	He. 111	310	930	4,400	3 m.g.
	Ju. 86	230	670	2,200	3 m.g.
Dive bombing ...	Hs. 123	250	370	660	2 m.g
	He. 108	250	870	1,100	1 m.g. 1 s.g.
Fighting	Bf. 109	310	370	—	3-4 m.g.
	He. 112	300	685	130	4 m.g.
Reconnaissance ...	Do. 17	300	930	1,100	3 m.g.
	He. 70	225	1300	660	2 m.g.
	Hs. 112	175	600	—	2 m.g.

In April, 1939, the first-line strength had been doubled (6,000 machines), new types replacing at the same time some obsolescent machines. Characteristics of the new types are:—

Duties	Type	Top speed at 13,000ft. m.p.h.	Range miles	Armament*		Power plant h.p.
				M.G. or S.G.	Bombs load lb.	
Bombing ...	Ju. 88	280	—	3 m.g.	3,100	2 D.B. 601 = 2,400
	He. 111	280	930	3 m.g.	4,400	2 D.B. 601 = 2,400
	Do. 17Z	280	500	3 m.g.	2,200	2 Jumo 211= 2,200
Dive bombing	Ju. 87	240	500	3 m.g. 1 s.g.	1,100	1 Jumo 211= 1100
Fighting ...	He. 112	290	680	2 m.g. 2 s.g.	130	1 Jumo 210= 685
	Bf. 109	320	370	3-4 m.g.	—	1 D.B. 601 = 1200
	Bf. 110	350	—	4 m.g. 2 s.g.	—	2 D.B. 601 = 2400
Reconnaissance (long range) ...	Do. 17F	230	1250	2 m.g.	880	2 D.B. 600 = 1,820
Reconnaissance (short range) ...	Hs. 126	220	500	2 m.g.	220	1 B.M.W. 132 = 870

Of the total first-line strength it is said that 3,000 machines are bombers, 2,000 fighters, and 1,000 reconnaissance aircraft.

In several instances the performance figures given in the table are to be treated with reserve. The Hs. 123, for example, is not capable of 250 m.p.h. when carrying its bomb load. On the other hand, the figure of 230 m.p.h. given for the Dornier Do.17F reconnaissance machine presumably relates to a version fitted with the old B.M.W. engines and not with the newer Daimler-Benz inverted vee-twelves. The Junkers Ju.88 bomber is listed as being fitted with D.B.601 engines, whereas the version which lately broke some speed-with-load records had Jumo 211s with nose-type radiators.

* M.G.= Machine Gun. S.G.= Shell-gun.

Italy's New Parachute

THE increase in speed of modern military aircraft has rendered necessary a revision of technique in manufacturing parachutes. A jump from an aircraft travelling at high speed submits the parachute and its wearer to great strain, which may jeopardise the life of the jumper. The Italian Salvator concern, with its new D.39 parachute, claims to have rendered progressive the braking action after the almost instantaneous opening of the canopy and to have secured better distribution of shock to the wearer's body.

The canopy of the D.39 is a special high-resistance silk and has an area of about 485 sq. ft. In its summit is an elastic hole which dilates when the canopy opens so that the shock is reduced and greater stability is secured. When the speed is stabilised this hole gradually closes until the canopy assumes its normal braking effect.

The new Italian Salvator D.39 parachute, designed specially for use from high-speed military aircraft.

Mexican Grummans

FORTY Grumman fighters and ten training aircraft will be built for the Mexican Government by the Canadian Car and Foundry Company at a factory in Mexico City, where workers will be recruited in the Mexican army to eliminate possible labour troubles. The Canadian company will supervise the building of the aircraft but will not invest capital in the plant, which will be owned by the Mexican Government. Two Canadian executives will go to Mexico city, and dies and jigs for the aircraft will come from the Grumman factory in the United States. It is expected that machines will be built at the Mexican plant for other Latin-American countries. The arrangement allows for an even division of profits between the Canadian Car and Foundry Company and the Mexican Government.

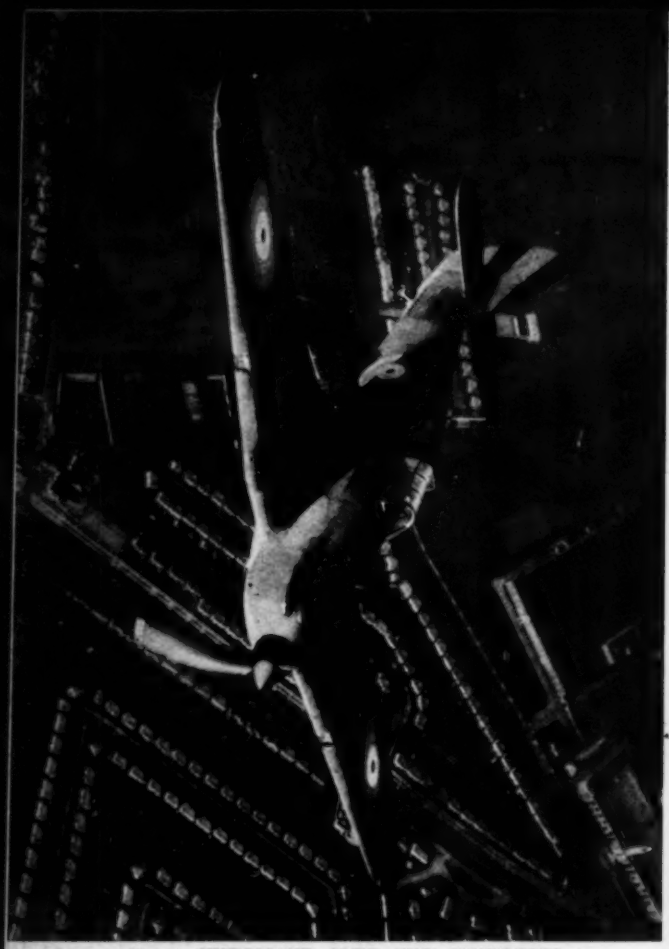
A General-purpose Bellanca

IT is thought that a considerable number of Bellanca low-wing monoplanes resembling in essentials the *Irish Swoop* (alias *Miss Dorothy*) has been supplied to the Chinese Government. The newest version of this machine, designated the Model 28-110, is fitted with the latest Pratt and Whitney Twin Wasp of the "C" series, driving a constant-speed airscrew, and is capable of a top speed of 290 m.p.h. at 8,000ft. The machine may be used as a single- or two-seater fighter or as a bomber, and has fittings to accommodate the following armament loads: Two fixed rifle-calibre guns, located in the side of the fuselage, synchronised with the airscrew and provided with 360 rounds of ammunition each; two fixed wing guns of the same calibre, with 500 rounds for each gun; one rifle-calibre gun in the rear cockpit with 600 rounds of ammunition; an internal vertical bomb rack for four 300-lb. bombs; and two M-30 demolition bombs (102lb. each) mounted on each wing within fairings on the lower surface.

COASTAL DEFENCE: The first Fokker T.8-W torpedo-bomber float-plane for the Dutch Government. Apparently the engines are Wright Whirlwinds. The torpedo is carried internally.

Service Aviation

AT HOME and A



"Flight" photograph

(Above) HURRICANE OVER THE HOUSETOPS: A striking aerobatics photograph that recalls, in a curious way, a Spitfire picture which appeared in "Flight" a year ago, and which is reproduced again for comparison. Sqn. Ldr. J. W. Donaldson was the Hurricane pilot. The rudder stripes are shadows.

(Below) JACK-IN-THE-BOX: A Hawker Hurricane, one of a batch built some time ago for Yugo-Slavia, test-piloted by Flt. Lt. R. C. Reynell, makes a startling entry through the cloud-floor.

"Flight" photograph

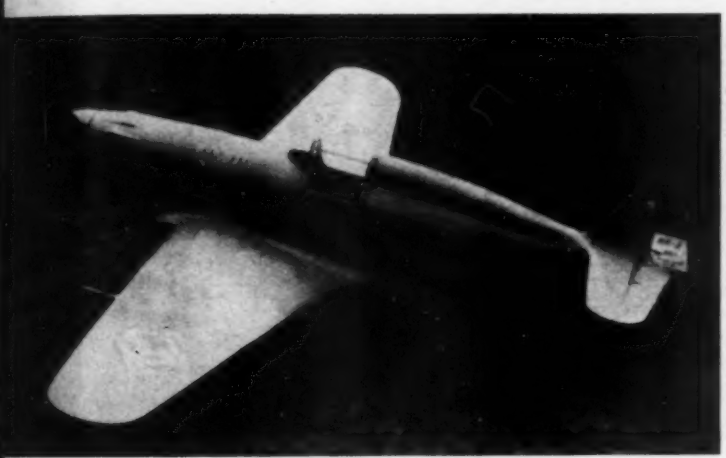
"Flight" photograph

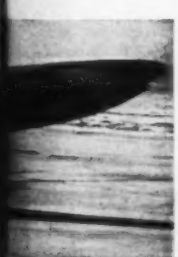
ABROAD

(Right) **GETTING THE FEEL OF IT :** Practice on the range at Felixstowe with a Vickers K (nearest camera), a Vickers and a Browning gun. Behind is a Scarff-mounted Lewis.
"Flight" photograph

(Centre, right) **A new type of fixed camera-gun now being used by the German Air Force.**

(Below) **A FIGHTER FROM BELGRADE :** Described as "the First Servian Aeroplane Company," G. Rogojarsky Ltd., of Belgrade, have lately built this sturdy-looking fighter—the IK-3—with Hispano *moteur canon*.





(Above) **U.S. FIGHTER :** The new XP41 Seversky (Twin Wasp) has a fully retractable undercarriage.

(Left) **TALKING IT OVER :** Hawker test pilots at Brooklands—Flt. Lt. Philip Lucas, Mr. K. G. Seth-Smith, Mr. John Grierson and Flt. Lt. R. C. Reynell.

(Right) **CLOSE-UP :** A Handley Page Hampden in rather startling proximity to another from which our photograph was taken.
"Flight" photograph

"Then suddenly I thought of Broxbourne . . ."

THIS CAG went SOLO BEFORE he FLEW DUAL

By J. HARRISON, A.M.I.Mech.E., A.M.I.A.E.

THIS is the confession of a 43-year-old who started in aviation in 1912 but did not learn to fly until 1937, long after he had severed active connection with the industry. The writer actually flew 1 hour 26 minutes solo before receiving any dual instruction. It was not until February this year that he passed his "A" licence test.

JUST after the Army Trials of 1912, when aeroplanes were box-kites, I entered the works of the old British and Colonial Aeroplane Co. at Filton, makers of Bristol aeroplanes, as a works apprentice. In 1915 I went into the Supermarine works at Woolston, then run by N. Pemberton-Billing and Hubert Scott-Paine, who, after the war, left aviation to become identified with high-speed motor-boats. While at Southampton I joined the R.N.A.S. and was told to go home to my job. They would call me up when they wanted me. I am still waiting.

A year later I joined T. S. Duncan, then the head of the Aircraft Mechanisms Department of Vickers, Ltd., who eventually made me his leading draughtsman. He was a marvellous chap whose whole-time job was thinking up gadgets to defeat the enemy. I still regard him as the ablest technician in the war. A few years after the war I forsook engineering for journalism, but it was not until 1935 that, as a passenger, I had my first long cross-country flight. Shortly afterwards, Robert Kronfeld, the glider expert, read a paper before the Institution of Mechanical Engineers in which he described his Drone monoplane and the Kronfeld Ground Trainer. He affirmed that he could teach a man to fly solo following a series of lectures and some Ground Trainer lessons.

Over a year elapsed before he had got his system sufficiently far developed to allow me even to think of trying it. By dint of sheer persistence I got him to promise me that I would be his first pupil.

The Ground Trainer proved to be a rudimentary aeroplane propelled by a 10 h.p. Ford engine. It had an aeroplane's tail surfaces and ailerons, but its wing surfaces were about the size of tin trays. You could go through a lot of the evolutions of flight but not get off the ground.

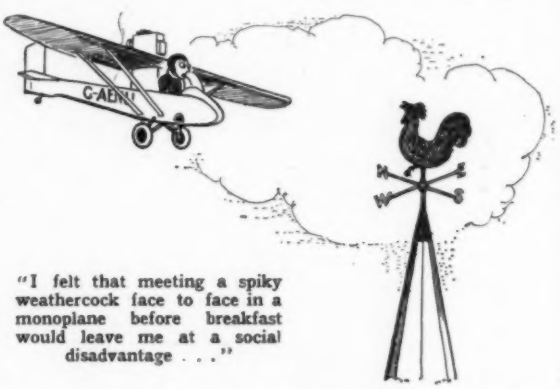
In front of the control column stood a vertical strut with three cross-bars on it, called a horizon bar. When the lowest of the three cross-bars was aligned on the horizon the trainer was in its climbing position; the centre cross-bar on the horizon represented level flight; and the upper one on the horizon was the correct gliding angle. Elevator control was taught with chocks in front of the wheels, my job being to lift the tail by pushing the control column forward and then hold the trainer horizontal. Elementary aileron control was practised in a high wind, the trainer being at 45 degrees to the wind and the gusts fought by sideways movements of the stick.

Slow tail-down taxi-ing was followed by taxi-ing at flying speed over the rough surface of the aerodrome, the turns being banked as in flight. In all, I spent 3½ hours on the trainer—which, by the way, had no springs and a cushionless seat. Long before they were over I became accustomed to taking my meals standing and to sleeping face downwards.

Then came the never-to-be-forgotten day when George, the ground engineer, wheeled out the Drone—a real aeroplane at last. It was decided that future lessons must take place at dawn, when the air was calm and there was no one about.

The Drone, as readers will remember, was an unusual type of ultra-light single-seater monoplane with a pusher airscrew. In front of the windscreen was a horizon bar similar to that fitted to the Ground Trainer. The fact that the pilot sat in front of the wing was one of its characteristics that made it so easy to control, for one had perfect visibility all the time, even when taxi-ing tail down. Moreover—another boon to the novice—the stalling speed was in the region of 20 m.p.h., though one used to come in about 32-35 to leave a safety margin.

Kronfeld so fixed the throttle that the Carden motor could not exceed 1,800 r.p.m. (its take-off speed was 3,500 and its normal cruising rate 2,800). After a period of slow taxi-ing came the first tail-up runs at 2,200 r.p.m., and then short, straight hops. Before each hop George and Kronfeld would stand one each side of the fuselage, and in chorus we would chant, "As soon as she leaves the ground close the throttle immediately."



"I felt that meeting a spiky weathercock face to face in a monoplane before breakfast would leave me at a social disadvantage . . ."

Later I was allowed to use full engine for take-off, and the short hops became longer.

At last came the momentous first circuit. I climbed out of the aerodrome, leaving the two tall poplar trees on my

"Flight" photograph

"The ground trainer proved to be a rudimentary aeroplane propelled by a 10 h.p. Ford engine. It had an aeroplane's tail surfaces and ailerons, but its wing surfaces were about the size of tin trays."

left, turned again behind the General Aircraft Works, went round Hanworth Church and came in over the houses on the south-eastern boundary. All my preconceived doubts about clearing the boundary obstructions after taking off had vanished with the realisation of the lightly loaded Drone's climbing abilities.

I made three or four more circuits and then a cross-country flight. You have all heard the story of the man who could scarcely swim a stroke; he fell over the side of a liner and swam five miles back to the shore to save his life. My first cross-country flight was somewhat along those lines.

Having made three of four left-hand circuits I thought it a good idea to fly from the front of the Tipsy hangars in a right-hand circuit. As I neared the aerodrome main gate, for some reason or other I funked the right-hand turn, so carried straight on over the railway junction. Then I suddenly realised that somewhere behind were two tall poplar trees and the spire of Feltham Church. I felt that meeting a spiky weathercock face to face in a monoplane before breakfast would leave me at a social disadvantage, and so carried straight on in the direction of Brentford, climbing all the time. Then I saw another church spire that appeared to be miles beneath me (it was actually some 600 to 800 feet). Therefore I turned round joyously, and was able to see in the dim distance the railway junction and then the aerodrome. I do not think that I shall ever forget the sight of Mr. and Mrs. Kronfeld and George standing in a little group, each with a bottle of milk in one hand and a box of crackers in the other, watching the Drone land—for thus they breakfasted on these strenuous occasions.

Object Attained

A few more circuits, and I had sufficient material for a series of feature newspaper articles on "solo instruction" flying; this had been one of the objects of the venture.

Before I could do any more about it Kronfeld's concern went into liquidation and I went into hospital for a minor operation that resulted from a car crash, remaining earth-bound until the summer of last year.

Then I went the round of the aero clubs. I don't want to be unkind to the sport that has treated me so well, but, case-hardened evening paper reporter that I am, some of those club-houses surprised me. The hard-drinking little snobs I met there did not line up with my idea of flying people.

Then suddenly I thought of Broxbourne, and there I met the kind of eager, sporting youngster that is the best that is in flying. Here was the enthusiasm and the kind of atmosphere that one expected in a flying club—a kindly, matey sort of place. Mind you, I am not suggesting that all the other clubs are of the kind I have just criticised.

I joined on July 17 last year, and D. A. Cracknell (who is now, I believe, at Gatwick) gave me my first lesson by taking me up to 2,000 feet and saying, "You've got her." He had read my articles and wanted to find out just how much I knew. "What do I use as a horizon bar?" I shouted back.

"Line up the top of the engine casing with the horizon."

Herts and Essex use oldish Gipsy Moths, which, of course, have non-inverted engines. I am a little fellow, and on this first trip neither of us thought of packing me up with cushions. The engine seemed to rise yards above my head, so I yelled back, "Who works the rudder while I stand on the seat to look over the top?"

Ultimately I asked my instructor to align the machine on the horizon, and I flew around using the underside of the exhaust manifold as a guide. The first thing I realised was that the Moth reacted at least three times as quickly to its controls as did the Drone and that much less control movement was necessary. My first proposed gentle turn resulted in an evolution vastly different from the one intended. Having got over the initial errors of giving too much rudder and aileron and taken the precaution of bringing some cushions up with me, my progress to the stage where I was making approaches was very rapid.

Then Cracknell left Broxbourne, but not before he had become my small son's hero—not because he happened to be a good pilot, but for the reason that he always had seven lumps of sugar in his tea.

The story of the formation of the Civil Air Guard broke in the Sunday papers, and if any man made earlier application to join that much-discussed corps he must have got up very early indeed. Instructor Dennis Cather now took me in hand. He proved himself to be a painstaking, excellent mentor, but I just felt the most ham-handed, heavy-footed, cross-eyed idiot in all aviation. Nothing that I have ever done has given me such an inferiority complex as learning to fly

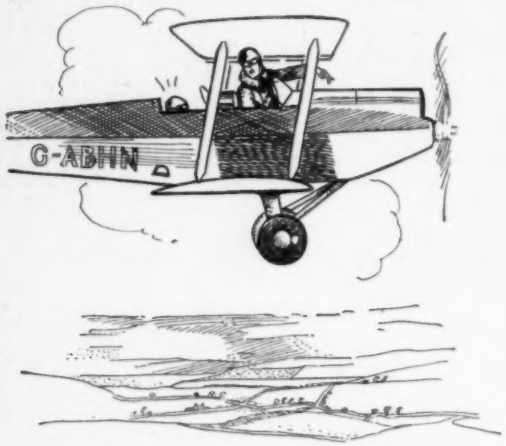
It was when I got on to landings that I found that there was more in flying than meets the eye. There is a vast difference between the 28 m.p.h. of the Drone and the

"Flight" photograph

"In front of the control column stood a vertical strut with three cross-bars on it, called a horizon bar."

65 of the Moth. On the Drone the fact that one could see all the time straight ahead, and that at the point of landing one's seat was only a couple of feet from the ground, helped a lot.

There were times when I made a couple of perfect landings in succession, followed by a perfectly horrible touch down. There were occasions when I would most assuredly have bent the aeroplane badly had not Cather snatched the stick out of my hand and opened up the motor.



Tall instructor: "Align the top of the engine cowling on the horizon."
Short pupil: "Do I stand on the seat to do it?"

Then came the day when Buster Frogley (a director of the club) leaned on the side of the machine and said, "If you mess up the aeroplane you'll have to buy the mechanics a hundred cigarettes." I did not realise the significance of that remark until some few minutes later, when I received my first lesson in spinning. I did *not* have to forfeit my cigarettes but, as my stomach was still rotating at tea time, I decided to cut that usually enjoyable meal.

When I did my own first spin I probably pushed the stick too far in correcting and opened up the engine too soon, for she came out in a vertical power drive, screaming with speed. Later I learned how to get into a spin by stalling on a gliding turn, giving full rudder and opposite aileron. This, incidentally, cured me of a playful habit of holding-off bank on the last gliding turn of the approach. In vain little Dennis used to expostulate, "One day you'll spin that aeroplane into the ground doing that." The practical demonstration did what neither fair words nor threats could accomplish.

I went solo in 13 hours 45 minutes' Broxbourne flying time, of which 12½ hours was on the C.A.G.

I am now able to reveal to *Flight* readers a deep-laid political plot. There are some people who believe that each C.A.G. costs the country £50 in subsidy. As a matter of fact, that subsidy comes back to the Treasury by way of the Post Office 'phone department with a whacking great profit. I went solo early in November. After that, several times a day, this kind of conversation took place over the telephone, each innings yielding the Treasury 4¾d. clear profit: "Is it O.K. for me to come down to-day?" "No, it's too windy. All machines are grounded." Sometimes the "too windy" was varied to "No, there is a fog on," or, "No, the aerodrome is snowed up," or, "No, the aerodrome is flooded."

I began to wonder if there was anything wrong with me. Was I like the little fellow in the advertisements who was shunned because he did not use the right kind of toothpaste or soap? Apparently it was not so, for all the other 79 Cags were in the same boat. Flying was just impossible for fledglings

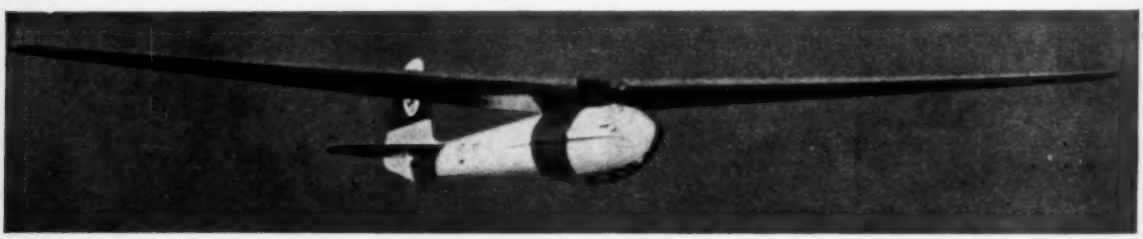
Days of delay turned into weeks, and it took exactly three months to build up 2 hours 20 minutes solo on the log book.

When Dennis took me up to show me the descent from 2,000 feet for my "A" Licence test I completely lost the aerodrome, and on the figures-of-eight test I found that the right-hand turns were more difficult than those to the left.

On Saturday, February 18, this year I was shown the height test again and a couple of the figures-of-eight. Then the barograph was put into the machine and I went off. I found it much easier than I had expected and got it right first time. In my anxiety not to muff it I flew up to 2,300 feet before throttling back. I made seven figures-of-eight and kept below 500 feet all the time.

Then I filled up apparently endless buff forms. My announcement to Buster that now I was one of the country's brave defenders was greeted from the Control Room by the dry remark: "That'll shatter the dictators."

STANDARD SAILPLANE for OLYMPIC GAMES



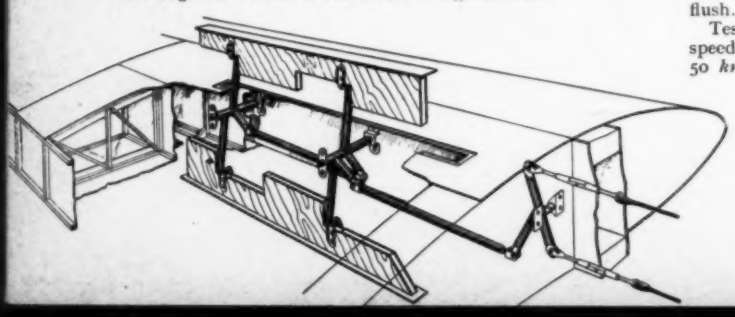
THIS year, for the first time, gliding is included as one of the competitions in the Olympic Games, which are to take place in Finland this summer.

It was considered necessary to evolve a standardised type of sailplane in this competition, and, after the F.A.I. had drawn up the requirements, Germany, Italy and Poland submitted five different types, which were tested by well-known pilots. After analysing the result the F.A.I. decided to adopt the "DFS-Meise," designed and constructed by Hans Jacobs, chief engineer of the Darmstadt Gliding Institute.

The machine is a high-wing cantilever of 15 *m.* (49ft. 4in.) span and 15 *sq. m.* (161½ sq. ft.) wing area. Both fuselage and wing are fairly conventional The wing spar is of double T section and the forward covering is of plywood, the rear being covered with fabric. The inner wing is of Göttingen 549 section, while the outer section is Göttingen 676.

A particularly neat feature is the arrangement of the spoilers for steepening the gliding angle. As will be seen from the sketch, a simple system of levers extends them both above and below the wing, in which they normally lie completely flush.

Test flights have given a gliding angle of 1 in 25, a sinking speed of 0.67 *m/sec.* (132ft./min.) and a stalling speed of 50 *km/hr.* (31 m.p.h.).



Details of the neat system of spoiler operation. The complete sailplane is seen above